

State of Alaska

Model Standing Orders  
and  
Treatment Protocols  
for  
EMT-1, EMT-2, EMT-3 and MICP

Second Edition

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**Reference Manual**

ACKNOWLEDGEMENTS .....	VII
PREFACE.....	IX
<b>GENERAL ORDERS.....</b>	<b>1</b>
PATIENT ASSESSMENT .....	3
I.    SCENE SIZE-UP/ ASSESSMENT .....	3
II.   INITIAL ASSESSMENT.....	3
III.   FOCUSED HISTORY AND PHYSICAL EXAM - MEDICAL PATIENTS .....	5
IV.   FOCUSED HISTORY AND PHYSICAL EXAM - TRAUMA PATIENTS .....	6
V.    DETAILED PHYSICAL EXAM .....	7
VI.   ON-GOING ASSESSMENT .....	8
VII.  SPECIAL NOTES.....	9
VIII.  TRANSPORT .....	9
PEDIATRIC PATIENT ASSESSMENT .....	11
I.    INTRODUCTION .....	11
II.   ASSESSMENT .....	11
III.   GENERAL IMPRESSION.....	12
IV.   COMMUNICATE AND TRANSPORT .....	12
DEATH IN THE FIELD (DNR/DOA) .....	13
I.    GENERAL POINTS.....	13
II.   WITHHOLDING RESUSCITATION:.....	13
III.   TERMINATING RESUSCITATION:.....	13
IV.   PRONOUNCEMENT OF DEATH: .....	14
V.    DOCUMENTATION: .....	14
VI.   NAEMSP TRAUMA CARDIAC ARREST GUIDELINES .....	15
DELAYED TRANSPORT .....	17
I.    GENERAL POINTS .....	17
II.   ASSESSMENT .....	17
DOCUMENTATION.....	21
I.    GENERAL POINTS .....	21
II.   USE THE SOAP FORMAT .....	21
III.   SPECIAL CONSIDERATIONS.....	21
REPORTING REQUIREMENTS .....	23
I.    AS 47.17.010-REPORTING CHILD ABUSE AND NEGLECT .....	23
II.   AS 47.24.010-REPORTS OF HARM .....	23
III.   AS 08.64.369-HEALTH CARE PROFESSIONALS TO REPORT CERTAIN INJURIES .....	23
SHOCK.....	25
I.    GENERAL POINTS .....	25
II.   ASSESSMENT .....	25
III.   MANAGEMENT .....	27
IV.   TRANSPORT .....	29
<b>MEDICAL.....</b>	<b>31</b>
ABDOMINAL PAIN - NONTRAUMATIC .....	32
I.    GENERAL POINTS.....	32
II.   ASSESSMENT .....	32
III.   MANAGEMENT .....	32
IV.   SPECIAL CONSIDERATIONS.....	33
ALLERGIC REACTION/ANAPHYLAXIS .....	35
I.    GENERAL POINTS .....	35
II.   ASSESSMENT .....	35
III.   MANAGEMENT .....	35
ALTERED MENTAL STATUS .....	37
I.    GENERAL POINTS .....	37
II.   ASSESSMENT .....	37
III.   MANAGEMENT .....	37

IV.	SPECIAL CONSIDERATIONS .....	38
	ASTHMA/COPD.....	41
I.	GENERAL POINTS .....	41
II.	ASSESSMENT .....	41
III.	MANAGEMENT .....	41
IV.	SPECIAL CONSIDERATIONS .....	42
	BEHAVIORAL EMERGENCIES.....	45
I.	GENERAL POINTS .....	45
II.	ASSESSMENT .....	45
III.	MANAGEMENT .....	45
	CARDIAC ARREST.....	47
I.	GENERAL POINTS .....	47
II.	ASSESSMENT .....	47
III.	GENERAL MANAGEMENT .....	47
IV.	VENTRICULAR FIBRILLATION AND PULSELESS VENTRICULAR TACHYCARDIA-EMT-3 .....	48
V.	PEDIATRIC VENTRICULAR FIBRILLATION AND PULSELESS VENTRICULAR TACHYCARDIA-EMT-3.....	49
VI.	PULSELESS ELECTRICAL ACTIVITY (PEA)-EMT-3 .....	49
VII.	ASYSTOLE-EMT-3 .....	50
VIII.	POST-ARREST-EMT-3.....	50
IX.	VENTRICULAR FIBRILLATION AND PULSELESS VENTRICULAR TACHYCARDIA-MICP.....	51
X.	PEDIATRIC VENTRICULAR FIBRILLATION AND PULSELESS VENTRICULAR TACHYCARDIA-MICP.....	51
XI.	PULSELESS ELECTRICAL ACTIVITY (PEA) -MICP.....	52
XII.	ASYSTOLE-MICP .....	53
XIII.	POST-ARREST-MICP.....	53
XIV.	TRANSPORT-ALL LEVELS .....	54
	CHEST PAIN .....	55
I.	GENERAL POINTS .....	55
II.	ASSESSMENT .....	55
III.	MANAGEMENT .....	55
IV.	TRANSPORT .....	56
	DIABETES .....	59
I.	GENERAL POINTS .....	59
II.	ASSESSMENT .....	59
III.	MANAGEMENT .....	59
IV.	TRANSPORT .....	60
	DYSRHYTHMIAS .....	61
I.	GENERAL POINTS .....	61
II.	ASSESSMENT .....	61
III.	MANAGEMENT .....	61
IV.	PEDIATRIC BRADYCARDIA .....	61
V.	BRADYCARDIA-EMT-3 .....	62
VI.	PEDIATRIC BRADYCARDIA-EMT-3 .....	62
VII.	PEDIATRIC TACHYCARDIA-EMT-3 .....	62
VIII.	PREMATURE VENTRICULAR COMPLEXES (PVC's) -EMT-3 .....	63
IX.	SUPRAVENTRICULAR TACHYCARDIA (SVT) -EMT-3 .....	63
X.	WIDE COMPLEX TACHYCARDIA-UNCERTAIN TYPE (WCT) -EMT-3 .....	63
XI.	VENTRICULAR TACHYCARDIA WITH A PULSE-EMT-3 .....	63
XII.	BRADYCARDIA-MICP .....	64
XIII.	PEDIATRIC BRADYCARDIA-MICP .....	64
XIV.	PEDIATRIC TACHYCARDIA-MICP .....	64
XV.	PREMATURE VENTRICULAR COMPLEXES (PVC's)-MICP .....	66
XVI.	SUPRAVENTRICULAR TACHYCARDIA (SVT)-MICP .....	66
XVII.	WIDE COMPLEX TACHYCARDIA-UNCERTAIN TYPE (WCT)-MICP .....	67
XVIII.	VENTRICULAR TACHYCARDIA WITH A PULSE-MICP.....	67
XIX.	TRANSPORT .....	68
	GASTROINTESTINAL BLEEDING .....	69

I.	GENERAL POINTS .....	69
II.	ASSESSMENT .....	69
III.	MANAGEMENT .....	69
	HYPERTENSION.....	71
I.	GENERAL POINTS .....	71
II.	ASSESSMENT .....	71
III.	MANAGEMENT .....	71
IV.	TRANSPORT .....	72
	HYPERVENTILATION.....	73
I.	GENERAL POINTS .....	73
II.	ASSESSMENT .....	73
III.	MANAGEMENT .....	73
	NEONATAL RESUSCITATION .....	75
I.	GENERAL POINTS .....	75
II.	ASSESSMENT .....	75
III.	MANAGEMENT .....	75
	OBSTETRIC/GYNECOLOGIC.....	77
I.	GENERAL POINTS .....	77
II.	ASSESSMENT .....	77
III.	MANAGEMENT .....	79
	OBSTRUCTED AIRWAY .....	81
I.	GENERAL POINTS .....	81
II.	ASSESSMENT .....	81
III.	MANAGEMENT-ADEQUATE AIR EXCHANGE.....	81
IV.	MANAGEMENT-POOR AIR EXCHANGE.....	82
V.	CAUTIONS .....	83
	POISONING/OVERDOSE .....	85
I.	GENERAL POINTS .....	85
II.	ASSESSMENT .....	85
III.	MANAGEMENT .....	85
	PULMONARY EDEMA .....	89
I.	GENERAL POINTS .....	89
II.	ASSESSMENT .....	89
III.	MANAGEMENT .....	89
IV.	TRANSPORT .....	90
	SEIZURES.....	91
I.	GENERAL POINTS .....	91
II.	ASSESSMENT .....	91
III.	MANAGEMENT .....	91
IV.	SPECIAL CONSIDERATIONS.....	93
	STROKE .....	95
I.	GENERAL POINTS .....	95
II.	ASSESSMENT .....	95
III.	MANAGEMENT .....	95
IV.	TRANSPORT .....	96
V.	SPECIAL CONSIDERATIONS .....	96
	VAGINAL BLEEDING .....	97
I.	GENERAL POINTS .....	97
II.	ASSESSMENT .....	97
III.	MANAGEMENT .....	97
	<b>TRAUMA.....</b>	<b>99</b>
	MAJOR TRAUMA.....	101
I.	GENERAL POINTS .....	101
II.	ASSESSMENT:.....	101
III.	MANAGEMENT .....	102

IV. TRANSPORT .....	104
ABDOMINAL TRAUMA .....	105
I. GENERAL POINTS .....	105
II. ASSESSMENT .....	105
III. MANAGEMENT .....	105
IV. TRANSPORT .....	106
V. SPECIAL CONSIDERATIONS .....	106
CHEST TRAUMA.....	109
I. GENERAL POINTS .....	109
II. ASSESSMENT .....	109
III. MANAGEMENT .....	110
IV. SPECIAL CONSIDERATIONS.....	112
DISLOCATIONS-DELAYED TRANSPORT .....	113
I. GENERAL POINTS .....	113
II. GENERAL TREATMENT.....	113
III. SHOULDER.....	114
IV. PATELLA .....	116
V. DIGITS.....	117
EXTREMITY TRAUMA .....	119
I. GENERAL POINTS .....	119
II. ASSESSMENT .....	119
III. MANAGEMENT .....	119
IV. TRANSPORT .....	121
HEAD TRAUMA.....	123
I. GENERAL POINTS .....	123
II. ASSESSMENT .....	123
III. MANAGEMENT .....	124
IV. TRANSPORT .....	125
SOFT TISSUE TRAUMA .....	127
I. GENERAL POINTS .....	127
II. ASSESSMENT .....	127
III. MANAGEMENT .....	127
IV. TRANSPORT .....	130
V. SPECIAL CONSIDERATIONS .....	130
<b>ENVIRONMENTAL.....</b>	<b>133</b>
AVALANCHE BURIAL .....	135
I. GENERAL POINTS .....	135
II. EVALUATION AND TREATMENT.....	135
COLD WATER NEAR DROWNING:.....	137
I. GENERAL POINTS.....	137
II. EVALUATION AND TREATMENT .....	137
DIVING EMERGENCIES .....	139
I. GENERAL POINTS.....	139
II. ASSESSMENT .....	139
III. GENERAL TREATMENT .....	139
IV. MANAGEMENT-ACUTELY SICK DIVE EMERGENCY PATIENTS.....	139
V. MANAGEMENT-STABLE DIVE EMERGENCY PATIENTS .....	140
VI. SPECIAL CONSIDERATIONS:.....	140
FROSTBITE .....	141
I. GENERAL POINTS .....	141
II. ASSESSMENT .....	141
III. MANAGEMENT .....	142
IV. SPECIAL CONSIDERATIONS.....	142
HEAT EMERGENCIES .....	145
I. GENERAL POINTS.....	145

II.	ASSESSMENT .....	145
III.	MANAGEMENT .....	146
IV.	SPECIAL CONSIDERATIONS.....	148
	HYPOTHERMIA .....	149
I.	GENERAL POINTS .....	149
II.	ASSESSMENT .....	150
III.	MANAGEMENT .....	150
	<b>PROCEDURES.....</b>	<b>155</b>
	BASIC AIRWAY MANAGEMENT .....	156
I.	INTRODUCTION .....	156
II.	OBJECTIVES .....	156
III.	RECOGNITION.....	156
IV.	MANUAL MANEUVERS:.....	157
V.	BASIC MECHANICAL ADJUNCTS: .....	159
VI.	VENTILATION:.....	162
VII.	SUCTIONING:.....	165
VIII.	TABLE OF TREATMENT ADJUNCTS: .....	167
	ADVANCED AIRWAY MANAGEMENT.....	168
I.	GENERAL POINTS.....	168
II.	DUAL LUMEN AIRWAY DEVICE .....	168
III.	LARYNGEAL MASK AIRWAY (LMA).....	169
IV.	ENDOTRACHEAL INTUBATION: .....	170
V.	RAPID SEQUENCE INTUBATION (RSI) (MICP LEVEL ONLY) .....	177
VI.	RETROGRADE INTUBATION.....	179
VII.	CRICOTHYROTOMY .....	180
VIII.	TABLE OF TREATMENT ADJUNCTS:.....	181
IX.	MEDICATIONS THAT CAN BE ADMINISTERED BY TRACHEA: .....	181
	FAILED AIRWAY ALGORITHM.....	182
	AUTOMATED EXTERNAL DEFIBRILLATION (AED) .....	183
I.	GENERAL POINTS: .....	183
II.	OBJECTIVES: .....	183
III.	RECOGNITION:.....	183
IV.	PROCEDURE: .....	183
	ASSISTING WITH MEDICATIONS .....	187
I.	GENERAL POINTS .....	187
	CHEST DECOMPRESSION.....	189
I.	GENERAL POINTS .....	189
II.	RECOGNITION .....	189
III.	PROCEDURE.....	190
IV.	CAUTIONS .....	191
	GASTRIC INTUBATION .....	193
I.	GENERAL POINTS.....	193
II.	CONTRAINDICATIONS.....	193
III.	EQUIPMENT .....	193
IV.	PROCEDURE.....	193
V.	COMPLICATIONS .....	194
	FOLEY CATHETER INSERTION.....	195
I.	GENERAL POINTS .....	195
II.	INDICATIONS .....	195
III.	EQUIPMENT .....	195
IV.	PROCEDURE: .....	195
V.	COMPLICATIONS: .....	197
	INTRAOSSEOUS ACCESS.....	198
I.	GENERAL POINTS .....	198
II.	INDICATIONS .....	198

III.	SITES .....	198
IV.	PROCEDURE.....	198
V.	COMPLICATIONS .....	199
	INTRAVENOUS ACCESS .....	201
I.	GENERAL POINTS .....	201
II.	EQUIPMENT .....	201
III.	PROCEDURE.....	201
IV.	COMPLICATIONS .....	202
	INJECTED MEDICATION ADMINISTRATION .....	203
I.	GENERAL POINTS .....	203
II.	PREPARE DOSE .....	203
III.	SUBCUTANEOUS ADMINISTRATION (SQ).....	204
IV.	INTRAMUSCULAR ADMINISTRATION (IM) .....	204
V.	IV BOLUS ADMINISTRATION .....	204
VI.	IV INFUSION ADMINISTRATION .....	204
	PNEUMATIC ANTI SHOCK GARMENT (P.A.S.G) GUIDELINES .....	207
I.	INDICATIONS .....	207
II.	CONTRAINDICATIONS.....	207
III.	PROCEDURE.....	207
IV.	SPECIAL POINTS .....	207
	PULSE OXIMETRY .....	209
I.	GENERAL POINTS .....	209
II.	OBJECTIVES .....	209
III.	INDICATIONS .....	209
IV.	PROCEDURE .....	209
V.	CAUTIONS.....	210
VI.	TREATMENT GUIDELINES .....	210
	RESTRAINT .....	211
I.	GENERAL ORDERS.....	211
II.	INDICATIONS .....	211
III.	MANAGEMENT .....	211
IV.	ASSESSMENT.....	212
V.	RISK MANAGEMENT .....	212
VI.	CAUTIONS.....	213
	SPINAL IMMOBILIZATION .....	215
I.	GENERAL POINTS:.....	215
II.	INDICATIONS:.....	215
III.	ASSESSMENT:.....	216
IV.	DOCUMENTATION: .....	217
V.	CAUTIONS:.....	218
<b>REFERENCE .....</b>		<b>215</b>
	CELSIUS TO FARENHEIT CONVERSIONS .....	221
	GLASGOW COMA SCALE .....	222
	PEDIATRIC VITAL SIGNS .....	223
	TELEPHONE NUMBERS .....	224
	RULE OF NINES .....	225

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The following persons served as reviewers of this document. The work involved in reviewing this document is an example of their dedication to EMS in Alaska. Their comments shaped the final version.

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- Ken Zafren, MD, Alaska Native Medical Center, Providence Alaska Medical Center
- The late Scott Dull, MD, State EMS Medical Director

As is the case with most protocols, this set of model standing orders was developed through consultation of many resources. The State of Alaska treatment guidelines for Burns, Cold Water Near Drowning, Delayed Transport, Diving Emergencies, Hypothermia, Frostbite, and Trauma were incorporated with little change. Other significant resources were:

- Alaska Medevac Manual
- Alaska EMS Skill Sheets
- American College of Surgeons ATLS Course Manual
- American Heart Association – ECC Guidelines 2000
- Anchorage Fire Department Medical Operations Manual
- Capital City Fire/Rescue EMS Treatment Guidelines
- City of Cleveland Out-of-Hospital Patient Care Protocols
- Interior Region EMS Council Regional Standing Orders
- Ketchikan Fire Department Standing Orders
- NAEMSP Guidelines for Withholding or Termination of Resuscitation in Prehospital Traumatic Cardiac Arrest
- RSI protocol - Rick Janik, BSN
- Southeast Region EMS Council BLS Treatment Guidelines
- Southern Region EMS Council Regional Standing Orders
- U.S. Department of Transportation National Standard Curricula for EMS
- Wilderness Medical Associate's Wilderness EMT Curriculum
- State of Alaska EMS Office-Responding to Behavioral Emergencies Guidelines
- Ken Zafren Draft Avalanche Rescue Guidelines

## PREFACE

### **To the Administrator:**

These protocols were designed to serve as a model for those services wanting to adopt written protocols or those that need revised protocols. They are model guidelines and are not intended to be interpreted as strict orders. Services may modify this document to meet local needs. Treatments and procedures listed herein follow the State of Alaska curricula with few exceptions. The BLS portion of this protocol may be incorporated into your service immediately. The advanced life support orders in this document must be reviewed and approved by a physician medical director before EMTs and MICPs may perform advanced life support.

### **To the Physician Medical Director:**

These protocols were developed to assist EMS agencies in establishing written standing orders. They are designed as a model set of medical standing orders. This document was peer reviewed by emergency physicians, mobile intensive care paramedics, and EMTs. The Medical Director approving this set of protocols should be familiar with their content and with the skill level of the providers expected to use them.

The orders are meant to be followed as guidelines for patient care. The Medical Director must decide which orders within will be standing orders and which will require on-line direction. As a general style within the text, the items prefaced by "consider" or "anticipate" should be interpreted as requiring on-line medical direction.

Medical Directors are encouraged to modify this document to meet local needs. Any deviations from the EMT scope of practice must be arranged through the provisions of 7 AAC 26.670. These arrangements must include a written request to the State EMS Office, a plan for training and evaluation and a list of authorized individuals who have completed the training. For example, EMT-3s may be trained and authorized to administer nebulized albuterol for asthma which is not listed in the scope of certified activities (scope of practice) for an EMT-3 (7 AAC 26.040.)

### **To the EMT/MICP**

These model standing orders present guidelines for management of common pre-hospital emergencies. As with any protocol, they are not all encompassing. Nor are they meant to be strict "cookbook" orders. It is recognized that patients do not present in textbook fashion and techniques and procedures should be modified to meet the demands of field rescues.

These protocols are fairly liberal. They do not require contacting medical control for many orders. This is in recognition of the communication difficulties in this state. As a general style within the text, the items prefaced by "consider" or "anticipate" should be interpreted as requiring on-line medical direction. It is recommended, however, that medical control be contacted by voice when possible for every patient contact.

The management section presents sequential instructions. Every provider should follow the BLS section. EMT-2 providers should follow the BLS section and the EMT-2 section. EMT-3 providers should follow the BLS, EMT-2 and EMT-3 sections. MICPs should provide the care listed for all levels plus MICP. The Cardiac Arrest and Dysrhythmias protocols are exceptions to the sequencing. EMT-3 and MICP directions are separate. EMT-3s and MICPs should follow the BLS and EMT-2 orders and then progress directly to the EMT-3 or MICP orders.

Treatments and procedures listed herein follow the State of Alaska curricula with few exceptions. You may perform the BLS portion of this protocol. ***ALS treatments/procedures may only be performed under the direction of a physician, either by direct verbal communications or through physician signed standing orders.***

# **GENERAL ORDERS**



# PATIENT ASSESSMENT

## I. SCENE SIZE-UP/ ASSESSMENT

- A. Body substance isolation –consider applying en route to the scene
  - 1. Eye protection if necessary
  - 2. Gloves if necessary
  - 3. Gown if necessary
  - 4. Mask if necessary
- B. Scene safety
  - 1. Personal protection - Is it safe to approach the patient? Do not approach if unsafe. Consider wearing helmet, rescue coat, soft body armor, personal floatation device, etc.
    - a) Crash/ rescue scenes
    - b) Toxic substances - low O<sub>2</sub> areas
    - c) Crime scenes - potential for violence
    - d) Unstable surfaces - slope, ice, water
  - 2. Protection of the patient - environmental considerations
  - 3. Protection of bystanders-help the bystander avoid becoming a patient
  - 4. Do not enter unsafe scenes
  - 5. Scenes may be dangerous even if they appear to be safe
- C. Mechanism of injury/ nature of illness
  - 1. Determine the total number of patients
    - a) If there are more patients than the responding unit can effectively handle, initiate a mass casualty plan
      - (1) *Obtain additional help prior to contact with patients: law enforcement, fire, rescue, ALS, utilities*
      - (2) *Begin triage*
  - 2. Nature of injury/illness - determine from the patient, family or bystanders why EMS was activated

## II. INITIAL ASSESSMENT

- A. General impression of the patient
  - 1. Determines priority of care based on the medic's immediate assessment of the mechanism of injury/illness and chief complaint
  - 2. Determine if medical or trauma
  - 3. If injured, identify mechanism of injury
  - 4. If ill, identify nature of illness
  - 5. Age
  - 6. Sex

- B. Assess the patient and determine if the patient has a life threatening condition
  - 1. If a life threatening condition is found, treat immediately
  - 2. Assess nature of illness or mechanism of injury
- C. Assess mental status (maintain spinal immobilization if needed)
  - 1. Levels of mental status (AVPU)
    - a) Alert
    - b) Responds to Verbal stimuli
    - c) Responds to Painful stimuli
    - d) Unresponsive – no response
- D. Assess the airway
  - 1. Patent (open)
  - 2. Obstructed
    - a) Suction
    - b) Position
    - c) Airway adjuncts
    - d) Invasive techniques
- E. Assess breathing
  - 1. Adequate
  - 2. Inadequate
- F. Assess circulation
  - 1. Assess the pulse
  - 2. Assess for major bleeding-if present, control bleeding
  - 3. Assess perfusion by evaluating skin color, temperature and condition
- G. Identify priority patients and expedite transport
  - 1. Poor general impression (poor color, diaphoretic, look of doom)
  - 2. Unresponsive patients
  - 3. Responsive, not following commands
  - 4. Difficulty breathing
  - 5. Shock
  - 6. Complicated childbirth
  - 7. Chest pain with BP <100 systolic
  - 8. Uncontrolled bleeding
  - 9. Multiple injuries
  - 10. Very young and very old
- H. Proceed to the appropriate focused history and physical examination

### III. FOCUSED HISTORY AND PHYSICAL EXAM - MEDICAL PATIENTS

#### A. Responsive patient

1. Determine chief complaint
2. History of present illness
  - a) Onset-what were you doing when this happened?
  - b) Provoking/palliative factors-does anything make this better or worse?
  - c) Quality-Describe how this feels. Is anything different?
  - d) Radiation-does it go anywhere or stay in one place?
  - e) Severity-Rate this on a 1-10 scale (10 being worst possible).
  - f) Time-what time did this start, how long has it lasted?
3. Sample history
  - a) Signs and symptoms
  - b) Allergies
  - c) Medications
  - d) Past medical history
  - e) Last oral intake
  - f) Events leading to illness/injury
4. Current health status
5. Perform physical examination
  - a) Use your eyes, ears, and hands before you use tools.
  - b) Assess the area of the chief complaint and related areas. For example if the patient complains of dyspnea, the chest should be inspected, auscultated and palpated as well as the neck and feet.
6. Assess baseline vital signs-consider taking orthostatic vital signs
7. Follow the appropriate protocol for the condition found.

#### B. Unresponsive medical patients

1. Perform rapid assessment of all body areas to determine cause
  - a) Position patient to protect airway
  - b) Assess the head
  - c) Assess the neck
  - d) Assess the chest
  - e) Assess the abdomen
  - f) Assess the pelvis
  - g) Assess the extremities
  - h) Assess the posterior aspect of the body
2. Assess baseline vital signs

3. Obtain patient history from bystander, family, friends, and/ or medical identification devices/ services
  - a) Chief complaint
  - b) OPQRST
  - c) SAMPLE

#### IV. FOCUSED HISTORY AND PHYSICAL EXAM - TRAUMA PATIENTS

- A. Re-consider mechanism of injury
  1. Helps identify priority patients and guide assessment
  2. Significant mechanism of injury
    - a) Ejection from vehicle
    - b) Death in same passenger compartment
    - c) Falls > 20 feet
    - d) Roll-over of vehicle
    - e) High-speed vehicle collision
    - f) Vehicle-pedestrian collision
    - g) Intrusion into passenger compartment
    - h) Motorcycle crash
    - i) Unresponsive or altered mental status
    - j) Penetrations of the head, chest, or abdomen
    - k) Consider the possibility of hidden injuries from seat belts and airbags
  3. Infant and child considerations
    - a) Falls >2 times body height feet
    - b) Bicycle collision
    - c) Vehicle in medium speed collision
- B. Perform **rapid physical examination on patients who are unreliable or who have a significant mechanism of injury** to determine life-threatening injuries
  1. In the responsive patient, symptoms should be sought before and during the trauma assessment
  2. Continue spinal stabilization
  3. Reconsider transport decision
  4. Assess mental status
  5. Examination-look and feel for injuries or signs of injury
    - a) Inspect and palpate the head
    - b) Inspect and palpate the neck
    - c) Apply cervical spinal immobilization collar
    - d) Inspect, auscultate and palpate the chest
    - e) Inspect and palpate the abdomen
    - f) Inspect the pelvis and compress in and down checking for instability
    - g) Inspect and palpate all extremities, check motor, sensation and pulse
    - h) Roll patient with spinal precautions and inspect and palpate posterior

- i) Look for medical identification devices
  - j) Assess baseline vital signs
  - k) Assess patient history
    - (1) *Chief complaint*
    - (2) *OPQRST*
    - (3) *SAMPLE*
- C. For patients with no significant mechanism of injury, e.g., cut finger, perform focused history and physical exam of injuries. The focused assessment is performed on the specific injury site
  - 1. Assess baseline vital signs
  - 2. Assess patient history
    - a) Chief complaint
    - b) OPQRST
    - c) SAMPLE

## V. DETAILED PHYSICAL EXAM

- A. Patient and injury specific, e.g., toe pain, does not require a detailed physical exam
- B. Perform after focused exam to gather additional information
- C. General approach
  - 1. Examine the patient systematically
  - 2. Place special emphasis on areas suggested by the present illness and chief complaint
  - 3. Keep in mind that most patients view a physical exam with apprehension and anxiety - they feel vulnerable and exposed
- D. Overview of the detailed physical exam
  - 1. Mental status
    - a) Appearance and behavior
    - b) Posture and motor behavior
    - c) Speech and language
    - d) Mood
    - e) Thought and perceptions
      - (1) *Assess thought content*
      - (2) *Assess perceptions*
      - (3) *Assess insight and judgment*
    - f) Memory and attention
      - (1) *Assess remote memory (e.g. birthdays)*
      - (2) *Assess recent memory (e.g. events of the day)*

2. Overview of patient
    - a) Level of consciousness
    - b) Signs of distress
    - c) Apparent state of health
    - d) Skin color and obvious lesions/rashes
    - e) Height and build
    - f) Sexual development
    - g) Weight
    - h) Posture, gait and motor activity
    - i) Dress, grooming and personal hygiene
    - j) Odors of breath or body
    - k) Facial expression
    - l) Skin temperature/moisture
    - m) Head
    - n) Eyes
    - o) Ears
    - p) Nose and sinuses
    - q) Mouth and pharynx
    - r) Neck
    - s) Thorax and lungs
    - t) Cardiovascular system
    - u) Abdomen
    - v) Genitalia
    - w) Peripheral vascular system
    - x) Musculoskeletal system
    - y) Nervous system
  - E. Assess vital signs
- VI. ON-GOING ASSESSMENT
- A. Repeat initial assessment
    1. For a stable patient, repeat and record every 15 minutes
    2. For an unstable patient, repeat and record every 5 minutes at a minimum
    3. Reassess mental status
    4. Reassess airway
    5. Monitor breathing for rate and quality
    6. Reassess circulation
    7. Re-establish patient priorities
  - B. Reassess and record vital signs
  - C. Repeat focused assessment regarding patient complaint or injuries

- D. Assess interventions
  - 1. Assess response to management
  - 2. Maintain or modify management plan

## VII. SPECIAL NOTES

- A. In the alert patient, your greeting may complete the initial assessment. It may be clear the ABC's are stable and emergency intervention is not required before other assessment.
- B. If indicated, the spine should be immediately immobilized following scene survey.
- C. Be systematic. If you jump from one obvious injury to another, the subtle injury that may be most dangerous to the patient is more easily missed.
- D. Obtain and record two or more sets of vital signs and neurologic observations. A decision should not be made about the patient's stability based on one set of vital signs.
- E. Do not let the gathering of information distract from management of life-threatening problems.
- F. In medical situations, history is commonly obtained before or during the physical assessment. In trauma cases, it may be performed simultaneously or following the secondary survey.
- G. Over-the-counter medications (including aspirin) and birth control pills are frequently overlooked by patient and rescuer, but may be important to emergency problems.
- H. Confidentiality is mandatory. Patients deserve respect, kindness, and discretion. EMS personnel should not discuss details of EMS responses in public places or other locations where the conversation may be overheard, particularly if information identifying the patient must be used.
- I. Complete, legible documentation is critical to convey the information obtained above.

## VIII. TRANSPORT

- A. Patient transport should be done efficiently, safely, and quietly, avoiding, if at all possible, the use of lights and sirens.



# PEDIATRIC PATIENT ASSESSMENT

## I. INTRODUCTION

- A. Lack of understanding by the patient, poor cooperation, and fright often limit the ability to assess pediatrics completely in the field. Children often cannot verbalize what is bothering them, so it is important to do a systematic survey which covers areas that the patient may not be able to tell you about. Often it is best to do a "toe to head" survey in the conscious child. Any observations about spontaneous movements of the patient and areas that the child protects are very important. In the patient with a medical problem, the more limited set of observations listed below should pick up potentially serious problems.

## II. ASSESSMENT

- A. General:
  - 1. Level of alertness, eye contact, attention to surroundings.
  - 2. Muscle tone: normal, increased, or weak and flaccid.
  - 3. Responsiveness to parents, caregivers: is the patient playful or irritable?
- B. Head:
  - 1. Signs of trauma.
  - 2. Fontanelle: open, abnormal depression or bulging.
- C. Face:
  - 1. Pupils: size, symmetry, and reaction to light.
  - 2. Hydration: brightness of eyes. Is child making tears? Is the mouth moist?
- D. Neck: note stiffness.
- E. Chest:
  - 1. Note presence of stridor, retractions (depression between or inferior to ribs on inspiration) or increased respiratory effort.
  - 2. Listen to the chest:
    - a) Breath sounds: symmetrical, rales, wheezing?
- F. Abdomen:
  - 1. Distention, rigidity, bruising, and tenderness.
- G. Extremities:
  - 1. Brachial pulse. (Only for infants)
  - 2. Signs of trauma.
  - 3. Muscle tone, symmetry of movement.
  - 4. Skin temperature and color, capillary refill.
  - 5. Areas of tenderness, guarding or limited movement.
- H. Neurologic exam
  - 1. Assess level of consciousness,
  - 2. Motor sensory function and circulation x4

### III. GENERAL IMPRESSION

- a) Be alert for indications of child abuse, neglect or sexual assault.
2. Initial assessment
  - a) Respiratory failure is frequently the cause of cardiac arrest in children. Airway management is the priority.
  - b) Don't hyperextend or hyperflex patient's neck when opening and maintaining an airway.
3. Rapid or Focused Trauma/Medical Assessment
  - a) Consider the developmental age when assessing the child. Exam may be better tolerated if assessment begins from the feet up.
  - b) Assessment of perfusion should focus on mental status, skin color, temperature, condition, and peripheral pulses. This assessment will identify decreased perfusion well before the blood pressure changes.
  - c) Measuring blood pressure is not necessary if the above signs are assessed. Blood pressure is of questionable value in children under 10. A low blood pressure indicates decompensated shock while a child with a good blood pressure may have had up to 30% blood loss.
  - d) Children initially compensate in shock better than adults, then rapidly decompensate. Don't wait for decompensation before treating for shock.
4. Ongoing Assessment
  - a) Reassess constantly. Children get worse quickly and often without warning.

### IV. COMMUNICATE AND TRANSPORT

- a) Don't constrict child's abdomen, it may compromise breathing.
- b) Try to maintain a level of trust with the child by speaking directly to the child in a calm, confident, and reassuring voice. Do not separate a child from parents or caregivers unless necessary for treatment.
- c) Transport should be done efficiently, safely, and quietly, avoiding, if possible, the use of lights and sirens.

## DEATH IN THE FIELD (DNR/DOA)

### I. GENERAL POINTS

- A. AS 18.08.089 provides Alaskan EMTs, MICPs and physician assistants the authority to pronounce death under certain circumstances. *When in doubt, resuscitate.*
- B. To pronounce death, an EMT/ MICP must be an active member of an EMS service certified by the state AND be unable to immediately communicate with a physician “on-line.”

### II. WITHHOLDING RESUSCITATION:

- A. An EMT/MICP may withhold resuscitation efforts when the patient has injuries/illness incompatible with life. This includes cardiac arrest accompanied by:
  - 1. Blunt trauma.
  - 2. Incineration.
  - 3. Decapitation.
  - 4. Open head injury with loss of brain matter.
  - 5. Detruncation.
  - 6. Rigor mortis.
  - 7. Post mortem lividity.
  - 8. 30 minutes of CPR performed on a patient who is NOT hypothermic before the EMT/MICP arrival without a return of spontaneous respiration or pulse, and ALS isn’t available.
  - 9. Evidence of enrollment in Comfort One\* or other DNR program and confirmation of patient’s identity.

### III. TERMINATING RESUSCITATION:

- A. When unable to establish voice communications with a physician, an EMT/MICP may terminate efforts at resuscitation under the conditions listed below:
  - 1. 30 minutes of CPR was performed by the EMT/MICP on a patient who is NOT hypothermic without a spontaneous return of respiration or pulse, and ALS isn’t available.
  - 2. 30 minutes of ALS has been provided to a patient who is NOT hypothermic without spontaneous return of pulse or respiration.
  - 3. Hypothermic patient has received at least 60 minutes of CPR in conjunction with rewarming techniques\*\* (see the Alaska Cold Injuries Guidelines) with no spontaneous return of pulse or respiration.

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\* Comfort One is Alaska’s program establishing the patient's Do Not Resuscitate (DNR) status. Patients will wear a bracelet or carry a card or form showing enrollment. Unless wearing Comfort One bracelet, patient’s identity must be confirmed before orders are valid.

\*\* Rewarming techniques are outlined according the Hypothermia and Cold Water Near Drowning Protocol.

4. Once evidence of enrollment in Comfort One or other DNR program is established and the identity of the patient confirmed.

#### IV. PRONOUNCEMENT OF DEATH:

- A. Note and record time of pronouncement.
- B. If death was pronounced en route, reattempt communications with medical control. Transport the deceased according to local protocol. If no protocol exists, contact law enforcement in that jurisdiction for instructions.
- C. If death was pronounced at the scene, it is considered an unattended death:
  1. Notify law enforcement and if appropriate, the State Medical Examiner's Office (1-888-DECEASE).
  2. Treat the scene as if it were a crime scene. Do not move the body unless necessary to prevent further destruction of the scene.
  3. Protect the scene and minimize the number of personnel at the scene.
    - a) If in a residence or building; remember what you've touched, avoid touching more objects and using the residence phone.
    - b) Personnel should exit the scene by the same route they took to enter if possible.
    - c) Once the scene is secured, one controlled checkpoint should be used for entering and exiting the scene.
  4. Leave any tubes, IVs, EKG electrodes, and/or defibrillator patches in place.
  5. Don't disturb clothing, jewelry, pocket contents, or personal effects.
  6. Report to law enforcement before leaving the scene:
    - a) The condition of the scene and the placement of objects, etc.
    - b) Personnel involved at the scene and their roles.
    - c) Any statements made by the patient before death.

#### V. DOCUMENTATION:

- A. Contact medical control as soon as communications can be established.
- B. A physician must certify the pronouncement of death by an EMT/MICP within 24 hours.
- C. A run report should be written. Document the medical reasons that the pronouncement was made.
- D. The EMT/MICP must provide the following information to the person signing the death certificate:
  1. The name of the deceased.
  2. The date and time of death.
  3. The presence of a contagious disease if known.

## VI. NAEMSP TRAUMA CARDIAC ARREST GUIDELINES

- A. Guidelines for Withholding or Termination of Resuscitation in Prehospital Traumatic Cardiopulmonary Arrest: Joint Position Statement of the National Association of EMS Physicians and the American College of Surgeons Committee on Trauma
- B. The National Association of EMS Physicians (NAEMSP) and the American College of Surgeons Committee on Trauma (COT) support withholding or termination of resuscitation for out-of-hospital adult traumatic cardiopulmonary arrest (TCPA) patients who meet specific criteria.
- C. Resuscitation efforts may be withheld in any *blunt* trauma patient who, based on out-of-hospital personnel's thorough primary patient assessment, is found apneic, pulseless, and without organized ECG activity upon the arrival of EMS at the scene.
- D. Victims of *penetrating* trauma found apneic and pulseless by EMS, based on their patient assessment, should be rapidly assessed for the presence of other signs of life, such as pupillary reflexes, spontaneous movement, or organized ECG activity. If any of these signs are present, the patient should have resuscitation performed and be transported to the nearest emergency department or trauma center. If these signs of life are absent, resuscitation efforts may be withheld.
- E. Resuscitation efforts should be withheld in victims of penetrating or blunt trauma with injuries obviously incompatible with life, such as decapitation or hemicorporectomy (body cut in half).
- F. Resuscitation efforts should be withheld in victims of penetrating or blunt trauma with evidence of a significance time lapse since pulselessness, including dependent lividity, rigor mortis, and decomposition.
- G. Cardiopulmonary arrest patients in whom the mechanism of injury does not correlate with clinical condition, suggesting a nontraumatic cause of the arrest, should have standard resuscitation initiated
- H. Termination of resuscitation efforts should be considered in trauma patients with EMS-witnessed cardiopulmonary arrest and 15 minutes of unsuccessful resuscitation and cardiopulmonary resuscitation (CPR).
- I. Traumatic cardiopulmonary arrest patients with a transport time to an emergency department or trauma center of more than 15 minutes after the arrest is identified may be considered nonsalvageable, and termination of resuscitation should be considered.
- J. Guidelines and protocols for TCPA patients who should be transported must be individualized for each EMS system. Consideration should be given to factors such as the average transport time within the system, the scope of practice of the various EMS providers within the system, and the definitive care capabilities (that is, trauma centers) within the system. Airway management and intravenous (IV) line placement should be accomplished during transport when possible.
- K. Special consideration must be given to victims of drowning and lightning strike and in situations where significant hypothermia may alter the prognosis.

- L. EMS providers should be thoroughly familiar with the guidelines and protocols affecting the decision to withhold or terminate resuscitative efforts.

## DELAYED TRANSPORT

### I. GENERAL POINTS

- A. When operating in the delayed/prolonged transport context, one of the decisions that must be made in the scene size-up is whether to transport the patient to a higher level of care, or whether to bring a higher level of care to the patient. Because of the length of time involved, this decision should be made as early in the assessment process as possible.
- B. After completing the initial and focused assessment, the information gathered is arranged in the SOAP (Subjective, Objective, Assessment, Plan) format. The SOAP format is found in many clinical settings and is very useful in circumstances where the individual will be providing care over a longer period of time. It allows for more detailed assessment and planning than is usually possible with short patient encounters.
- C. Beware of the possibility of altered decision making in yourself and the victim because of prolonged environmental exposure resulting in hypothermia.

### II. ASSESSMENT

#### A. SUBJECTIVE

- 1. This category includes everything that the patient or bystanders have told you about the incident. The SAMPLE history includes the chief complaint and:
  - a) Symptoms: includes the patient's description of how he or she feels, e.g., complaints about nausea, pain, shortness of breath, etc.
  - b) Allergies: including environmental allergies such as hay fever, which may affect the patient until he or she can be removed from the outdoors.
  - c) Medications: prescription, over the counter and recreational. The increasingly common use of herbs, vitamins, and homeopathic remedies should not be forgotten.
  - d) Past pertinent medical history. This category includes the patient's medical history, which may have a bearing on the current chief complaint or injuries.
  - e) Last oral intake. In the ambulance context, this is reported to the receiving facility primarily in case the patient must be under anesthesia for an operation. In the delayed /prolonged transport context it is also important because the EMT's responsibilities include keeping the patient hydrated and replacing calories.
  - f) Events: This category includes the events leading to the current situation, including their chronology.

#### B. OBJECTIVE

- 1. Includes the examination of the patient, and the baseline vital signs.
- 2. This information is best analyzed if it is written down. Two of the most important items in the EMT's kit are a piece of paper and a pencil.

C. ASSESSMENT (Creation of a Problem List)

1. It is helpful to look at the assessments as a problem list. By simply writing down a list of all the things that you have found wrong with the patient during your assessment, including the history and physical exam, you have all the information you are going to get at that time, with the diagnostic equipment you have available.
2. Your assessment of some medical problems may be generic, such as abdominal pain. Further questioning and examination, however, may point you toward a more specific cause for the abdominal pain. The treatment may not change but the urgency of the evacuation may.
3. Fear of making a diagnosis prompts some EMTs to generalize, such as 'possibly fractured' leg. It is often better to make a yes or no judgment. Either the leg is considered to be fractured, in which case it needs the best splint you can engineer, or it is not, in which case it does not need a splint at all.
4. All problems found must be included on the problem list. The minor ones, like a laceration to the hand, which may be of no concern in the ambulance context, might become a major concern in the delayed/prolonged transport context.
5. An "anticipated problem list" should be made. This list includes all medical problems that may arise during the transport or later. Swelling would be an anticipated problem with an extremity fracture. Decompensated shock would be an anticipated problem for the patient in compensated shock. Cardiac arrest would be an anticipated problem for the patient with chest pain. By developing an anticipated problem list, the EMT is mentally prepared when an anticipated problem becomes real and is better able to determine the urgency of transport. Another use of the problem list is triage. One patient's current problems may be less than another patient's, but the anticipated problems may determine the order of evacuation.

D. PLAN

1. The plan should include a treatment for all of the items on the problem list and the anticipated problem list. By writing the lists there is less chance of something being forgotten or overlooked. There should be no plan without a problem or anticipated problem. In the ambulance context, resources such as O<sub>2</sub> are often used because they are available and may be of some help. The limited resources in the prolonged/delayed transport context require that resources be allocated and used in an informed manner that anticipates future needs.
2. For those findings and or treatments that are outside of the physician signed standing orders, the EMT should attempt to establish voice communication with a physician

E. RESOAP

1. During the course of the transport, the patient needs to be reevaluated. There is no set time span for doing this. If the EMT is comfortable with the stability of the patient, there may be a period of an hour or more without a reevaluation. Unstable patients should be reevaluated as circumstances allow.
2. Changes in the subjective and objective components may indicate changes in the problem list and anticipated problem list. Some problems, such as mild hypothermia, may disappear. Other anticipated problems may develop. This reevaluation is the single most important difference between the ambulance context and the delayed/prolonged transport context.



## DOCUMENTATION

### I. GENERAL POINTS

- A. Documentation should be considered a priority second only to the need to administer rapid treatment to the patient. Documentation should permit reconstruction of the event during later review. If estimated times are used, it should be clearly noted that the times are estimated.

### II. USE THE SOAP FORMAT

- A. Subjective
  - 1. What does the patient or bystander say happened?
  - 2. Why do they think this is happening?
  - 3. What did the SAMPLE and OPQRST reveal?
- B. Objective
  - 1. How does the scene look?
    - a) Windshield, dash, intrusion.
    - b) Signs of abuse or neglect.
    - c) Distance of fall.
    - d) Water temperature.
  - 2. What did you find in your physical assessment?
- C. Assessment
  - 1. What do you think is going on?
  - 2. What is the problem list?
  - 3. What are the anticipated problems?
- D. Plan
  - 1. What did you do?
  - 2. What time did you do it?
  - 3. Who did it?
  - 4. What happened after you did it?
  - 5. Where did you go?
  - 6. Who did you talk to?
  - 7. Who did you transfer the patient to?
  - 8. Communication with medical control including:
    - a) time of communication.
    - b) efforts to establish communication if unsuccessful.
    - c) orders received.

### III. SPECIAL CONSIDERATIONS

- A. Medevac – include aircraft type, N#, and maximum altitude.



## REPORTING REQUIREMENTS

### I. AS 47.17.010-REPORTING CHILD ABUSE AND NEGLECT

- A. EMTs are required to report suspicions of child abuse or neglect.
- B. The report must be made to the Office of Children's Services (OCS) of the Department of Health and Social Services (1-800-478-4444) or, if OCS cannot be reasonably contacted, the EMT may report his or her suspicions to the nearest peace officer.
- C. This statute provides immunity from civil damages for EMTs who make reports in good faith and penalties for those who do not make the required reports.
- D. Notification of your medical director or EMS supervisor is not sufficient to comply with the reporting requirements.

### II. AS 47.24.010-REPORTS OF HARM

- A. This section is similar to AS 47.17.010 except that it relates to abuse of persons 18 years of age or older who, because of physical or mental impairment, are unable to meet their own needs or to seek help without assistance.
- B. Under this statute, EMTs and MICPs are required to report suspicions that a vulnerable adult suffers from abandonment, exploitation, abuse, neglect, or self-neglect.
- C. The report must be made within 24 hours after first having cause for the belief. The number for submitting reports of harm is: 1-800-478-9996, or in Anchorage, 563-5654. Due to limited resources, the office is only staffed during normal business hours.
- D. If an elderly person is in danger or has suffered harm, the local law enforcement agency should be contacted immediately and the report of harm made to the Division of Senior Services the next business day.
- E. The statute provides immunity from civil liability to those making the report in good faith.

### III. AS 08.64.369-HEALTH CARE PROFESSIONALS TO REPORT CERTAIN INJURIES

- A. EMTs and MICPs are required to report certain injuries. These injuries include:
  - 1. Second and/or third degree burns covering five percent, or more, of the patient's body;
  - 2. A burn to the patient's upper respiratory tract or laryngeal edema due to the inhalation of superheated air;
  - 3. A bullet wound, powder burn, or other injury apparently caused by the discharge of a firearm;
  - 4. An injury apparently caused by a knife, axe, or other sharp object, unless the injury was clearly accidental; and
  - 5. An injury that is likely to cause the death of the patient, unless the injury was clearly accidental.

- B. An oral report must be made promptly to the Department of Public Safety (DPS) for all the injuries listed above. Written reports for patients with the conditions listed in (A) (1) and (2) must be made within three days to DPS. The Department of Public Safety has a form specifically for this purpose. A person making a report in good faith is immune from civil or criminal liability that may be incurred by making the report or participating in legal proceedings.

# SHOCK

## I. GENERAL POINTS

- A. There are different kinds of shock with radically different causes, and significantly different presentations, but the one condition that makes all types of shock similar is inadequate perfusion of organs and tissues. Children initially compensate better than adults, then rapidly decompensate.
- B. See also the Anaphylaxis and Allergic Reactions Protocol.
- C. Low blood pressure is a sign of decompensated shock. Do not wait for the BP to drop before you recognize shock. Always treat the patient and not the blood pressure. However, a low blood pressure in a patient who is alert, calm and without any other complaints does not require the same urgent treatment as the patient who is confused and restless.

## II. ASSESSMENT

- A. Hypovolemia - caused by volume losses such as bleeding or dehydration.
  - 1. Pulse-Tachycardia is an early sign of hypovolemia, before any change in blood pressure. As the condition worsens, the pulse becomes difficult to palpate.
  - 2. Respiratory rate-typically rises as body attempts to increase oxygen and blow off CO<sub>2</sub>.
  - 3. Skin-usually pale or ashen, clammy or dry skin. Sunken anterior fontanelle in infants
  - 4. Neurologic-restlessness, irritability, confusion, stupor, coma.
  - 5. Cardiopulmonary-chest pain, dyspnea.
  - 6. Renal-decreased urine output.
  - 7. Blood pressure-the diastolic pressure rises first then, as fluid/blood loss continues, the systolic pressure drops. This results in a narrow pulse pressure (the difference between systolic and diastolic blood pressure). As the condition worsens, systolic blood pressure begins to fall.
- B. Cardiogenic Shock - occurs when the cardiac pump fails to adequately perfuse the body and maintain the function of the organs.
  - 1. Pulse- normal, slow or rapid.
  - 2. Respiratory rate-elevated.
  - 3. Cardiopulmonary-abnormal heart rate, chest pain may be present when myocardial infarction is the cause of cardiogenic shock, or it may be from ischemia because of inadequate perfusion of the coronary arteries. May hear murmur. Dysrhythmias may be noted.
  - 4. Respiratory-short of breath, wet lung sounds. May have wheezing.
  - 5. Neurologic-restlessness, irritability, confusion, stupor, coma. Directly related to adequacy of cerebral perfusion/oxygenation/hypoxia.
  - 6. Renal-decreased urine output.

7. Blood pressure-initially normal or high and then low with a narrowed pulse pressure.
- C. Anaphylactic Shock - caused by vasodilation and bronchoconstriction.
  1. Pulse-rapid.
  2. Respiratory rate-elevated or unchanged.
  3. Skin-red rash, urticaria (hives).
  4. Bronchospasm, wheezing lung sounds. Stridor.
  5. Edema in hands, feet or face.
  6. Renal-decreased urine output.
  7. Blood pressure-low.
- D. Neurogenic Shock - Loss of the normal nervous system control of the vascular system results in vasodilation. Unlikely without paralysis.
  1. Pulse-rate usually normal or slow.
  2. Blood pressure-low with narrow pulse pressure.
  3. Look for trauma, for example, bruising, lacerations, or neck or back pain.
  4. Compromised neurologic function, such as paralysis.
  5. Skin-color often normal or even flushed.
  6. Neurogenic shock is different from most other forms of shock in that the generalized signs usually seen with other types of shock are minimal or absent.
- E. Septic Shock - Toxins from severe infection result in vasodilation. Most common in children and elderly.
  1. Pulse-rapid.
  2. Respiratory rate-elevated.
  3. Level of consciousness is sometimes impaired, ranging from confusion, to stupor, to coma.
  4. Temperature-often elevated. May be normal or low
  5. Look for signs of infection; pneumonia and urinary tract infection are the most common sources in the elderly.
  6. Dehydration is often present and should be suspected.
  7. Renal-decreased urine output.
  8. Blood pressure-low with a narrowed pulse pressure.

## F. Pediatrics

1. In the child, shock is a leading cause of cardiopulmonary failure. The signs and symptoms listed for adults above are also correct for pediatrics. There are some special considerations:
  - a) Children have a smaller overall blood volume than do adults. Figure 75-80ml/kg as total blood volume for a child. A 10 kg child would have a total volume of 750 ml. and a loss of 188 ml (less than one cup) would cause decompensated shock in this child, whereas an adult could tolerate this loss without problems.
  - b) Children maintain adequate blood pressure until about 25% of blood volume is lost. They do this by constricting the peripheral vasculature. The only use of the blood pressure in children is to determine whether the shock is compensated or decompensated.
  - c) Early signs of shock in a child include decreased level of consciousness, cool pale or mottled skin on the extremities, tachycardia, tachypnea, slow capillary refill, diminished peripheral pulses, decreased urine output, dry mucous membranes, sunken anterior fontanelle. Recognize these signs early and begin aggressive treatment before the child decompensates.

## III. MANAGEMENT

Every provider should follow the BLS section. EMT-2 providers should follow the BLS section and the EMT-2 section. EMT-3 providers should follow the BLS, EMT-2 and EMT-3 sections. MICPs should provide the care listed for all levels plus MICP.

### **BLS**

- A. Ensure neutral, in-line **spinal stabilization if indicated.**
- B. Be alert for airway complications and act aggressively to **ensure a clear airway and adequate breathing.**
  1. **Consider suction, positioning, and airway adjuncts.**
  2. **Administer high flow O<sub>2</sub> by non rebreather mask.** O<sub>2</sub> administration is always appropriate.
  3. **Assist ventilation** as needed.
- C. **Control hemorrhage.**
- D. Initiate **basic shock treatment** (supine, feet elevated, cover over and under to keep warm).
  1. Use caution when elevating entire body from legs (as with a patient on a backboard) in cases where bleeding is into the chest or abdomen, as this may compromise breathing.
  2. Consider PASG if shock is from controllable hemorrhage and patient does not have respiratory distress or injuries to chest or abdomen.

### **EMT-2**

- E. Hypovolemic, Septic, and Neurogenic Shock
  - 1. Perform **endotracheal intubation as indicated** by the Advanced Airway Management protocol.
- F. Establish **one or two IVs of normal saline or ringer's lactate**.
  - 1. Draw bloods if time allows.
  - 2. Use a macrodrip administration set.
  - 3. Largest catheter possible.
- G. If signs and or symptoms of shock are present, **run the IV solution wide open, reassessing vital signs after every 250 ml**. Watch for signs of circulatory overload.
  - 1. Run the IV at TKO if signs and symptoms of shock resolve.
  - 2. For **children less than eight**, place an intraosseous catheter (**IO**) if IV access cannot be quickly obtained and the patient has a depressed level of consciousness so that the procedure is not extremely painful. Use **20ml/kg fluid boluses** in place of wide-open fluids. Reassess after every bolus and repeat PRN.
  - 3. If the patient has **hemorrhagic shock**, IVs should be **started en route** to the receiving facility. Do not delay transport for IV access/fluid replacement.
  - 4. If the patient has an **uncontrollable hemorrhage** (e.g. internal bleeding), fluid resuscitate to and maintain a **systolic blood pressure of 90 mmHg**.
  - 5. If **non hemorrhagic** or **hemorrhage is controllable**, resuscitate to **normal vital signs**.
- H. Anaphylactic Shock.
  - 1. Follow Allergic Reactions/Anaphylaxis Protocol.

### **EMT-3**

- I. Hypovolemic, Septic, and Neurogenic Shock
  - 1. **Monitor ECG lead II**.
- J. Cardiogenic Shock.
  - 1. If patient is **has a pulse less than 60 bpm or greater than 150 bpm and is in shock**, refer to the **Dysrhythmia Protocol**.
  - 2. **Monitor ECG lead II**. Observe for dysrhythmias that may accompany cardiogenic shock. Treat per **Dysrhythmia Protocol**.
  - 3. Place IV of normal saline at a keep open rate with a microdrip administration set. Draw bloods if time permits. Beware of fluid overload.
  - 4. Consult with medical control for further instruction.
  - 5. If the patient's blood pressure improves but he or she is experiencing respiratory congestion or failure refer to the **Pulmonary Edema Protocol**.
- K. Anaphylactic Shock.

1. Follow Allergic Reactions/Anaphylaxis Protocol.

### **MICP**

#### L. Hypovolemic, Septic, and Neurogenic Shock

1. If transport is delayed and volume loading is inadequate to prevent continued signs of shock, **discuss** the use of **pressor infusions with medical control**.
2. Consider antibiotics for septic shock in the delayed transport setting. Discuss this option with medical control.

#### M. Cardiogenic Shock.

1. For adults if systolic BP is less than 100 mmHg with signs or symptoms of shock, administer **dopamine, 5-15 µg/kg/min., IV infusion**. Titrate drip rate to achieve a systolic blood pressure >100 mm Hg.
2. Cardiogenic shock in children is rare. Suspect it if the patient deteriorates after a 20ml/kg fluid bolus.
  - a) If present, administer dopamine, 2.5-20 µg/kg/min., IV infusion. Titrate dose to increased perfusion. To administer, multiply 6 x weight in kg. This is mg of dopamine to mix in 100 ml bag (also amount to be removed from bag) for total volume of 100 ml. 1ml/hr delivers 0.1mcg/kg.
  - b) Also consider an epinephrine infusion. To administer, multiply 0.6 x weight in kg. This is amount of 1:1,000 epi to mix in 100 ml bag (also amount to be removed from bag) for total volume of 100 ml. 1ml/hr delivers 0.1mcg/kg. Start at 20 ml/hour and titrate to desired effect.
3. Consult with medical control for further instruction.
4. A foley catheter should be placed to monitor urine output.

#### N. Anaphylactic Shock.

1. Follow **Allergic Reactions/Anaphylaxis** protocol.

## IV. TRANSPORT

- A. Rapid transport to the nearest hospital is key because treatment of most causes of shock cannot be accomplished in the out-of-hospital setting. Do not delay transport if the potential for shock exists.
- B. The patient in hemorrhagic shock with massive blood loss needs blood replacement. Loading with IV fluid will not be adequate. These patients should be considered major trauma and should be treated according to the **Major Trauma** protocol and rapidly transported to the nearest appropriate hospital as specified in that protocol.
- C. Notify the receiving facility of any patient in shock.
- D. Careful reassessment of the patient in a delayed transport setting is critical. While little may be done definitively in the delayed transport setting, changes in the patient's status may change the plan.

- E. If transport time is much delayed (>4 hrs.) administer 40 ml + weight in kg /hour of IV fluid to adults in addition to fluid needed for resuscitation. Also consider a dextrose solution if the patient is kept NPO-consult with medical control. For children administer maintenance fluids according to Broselow tape.

# MEDICAL

## ABDOMINAL PAIN - NONTRAUMATIC

### I. GENERAL POINTS

- A. Be alert for signs and symptoms of internal bleeding and the possibility of vomiting.
- B. Acute myocardial infarction may present as abdominal pain. Beware of this possibility and be prepared to treat for this condition.

### II. ASSESSMENT

- A. An accurate history is often the best indicator of the nature of the problem.
  - 1. Check for a history of previous abdominal surgery or disorders.
  - 2. Also question for a history of trauma in the last two weeks.
  - 3. Determine if there is a history of cardiac problems or other significant medical conditions.
- B. If the patient is experiencing abdominal pain and gastro-intestinal or vaginal bleeding, follow that protocol.
- C. Assess for fluid losses, such as through vomiting and diarrhea, and evidence of hypotension or dehydration. Time of last urination is important.
- D. Perform an abdominal exam searching for tenderness, guarding, rebound pain, and distention. Specific signs and symptoms to assess for include; pain radiating to other than abdomen, nausea/vomiting, anorexia, fever, jaundice, history of alcohol intake or large meal, recent ingestion of fatty foods, abdominal guarding, distention, and possibly a mass, urge to defecate, constipation. Critical signs are:
  - 1. Pulsing mass in the abdomen
  - 2. Absent or diminished femoral pulses
  - 3. Hypotension and Shock.
- E. Ask about missed birth control use, menstrual periods, positive pregnancy test, vaginal bleeding or discharge.

### III. MANAGEMENT

Every provider should follow the BLS section. EMT-2 providers should follow the BLS section and the EMT-2 section. EMT-3 providers should follow the BLS, EMT-2 and EMT-3 sections. MICPs should provide the care listed for all levels plus MICP.

#### **BLS**

- A. **Administer** O<sub>2</sub> according to the patient's needs.
- B. Allow patient to seek a **position of comfort** and treat for shock.
- C. **Monitor** and record vitals every 5-15 minutes.
- D. Give nothing by mouth.

### **EMT-2**

- E. **Perform airway management** as indicated by the **Advanced Airway Management** protocol.
- F. Establish one or two IVs **of normal saline or ringer's lactate**. Use a macrodrip administration set. Draw bloods.
- G. If signs and or symptoms of shock are present, **run the IV solution wide open, reassessing vital signs after every 250 ml**. Follow the shock protocol. Watch for signs of circulatory overload. Run the IV at TKO if signs and symptoms of shock resolve.

### **EMT-3**

- H. **Monitor ECG lead II**.

### **MICP**

- I. Consider placing a nasogastric tube and foley catheter if the transport time is extended.

## IV. SPECIAL CONSIDERATIONS

### A. Delayed Transport

- 1. Be prepared to assist the patient with toilet needs. Record the volume and appearance of urine and feces.
- 2. If transport time is much delayed (>4 hrs.) administer 40 ml + weight in kg /hour of IV fluid to adults in addition to fluid needed for resuscitation. Also consider a dextrose solution if the patient is kept NPO-consult with medical control. For children administer maintenance fluids according to Broselow tape.

### B. Medevac

- 1. Beware of conditions that may cause trapped gas in the abdomen. Flight levels should be as low as is safe for conditions such as bowel obstruction, necrotic bowel, and ruptured intestine.



## ALLERGIC REACTION/ANAPHYLAXIS

### I. GENERAL POINTS

- A. Allergic reactions commonly occur as the result of insect stings or exposure to substances to which an individual has sensitivity, such as medications, foods, cosmetics, detergents, and so forth. The difference between an allergic reaction and anaphylaxis is life threat. Allergic reactions may be uncomfortable whereas anaphylaxis is potentially life threatening.
- B. Pediatric Considerations-Airway swelling in a child reduces airflow significantly more than in an adult. Stridor indicates approximately 80% airway obstruction. Treat the child with airway swelling aggressively, but do not agitate a child in respiratory distress.

### II. ASSESSMENT

- A. Assess for respiratory distress. Patients in respiratory distress are usually sitting upright and leaning forward, and do not tolerate lying down. Look for increased respiratory effort or retractions. Listen for stridor in the upper airway. Observe for upper airway edema. The patient may also have wheezing, crackles, or absent breath sounds.
- B. Look for signs of shock: anxiety, confusion, weakness, depressed level of consciousness, tachycardia, weak, thready pulse, diaphoresis, cool skin, cyanosis, and hypotension
- C. Itching/Rash. The typical rash consists of raised areas called urticaria or "hives." They may be all over the body or only on some localized areas.
- D. Swelling or edema may be observed in the airway, face, or hands.
- E. Unless there is a recent obvious insect sting, many cases of allergic reaction or anaphylaxis will not have any apparent cause. Obtain a SAMPLE history, specifically asking about: history of allergies; foods recently eaten; medications taken; new cosmetics, soaps, clothing, etc.; effects; progression; interventions.

### III. MANAGEMENT

Every provider should follow the BLS section. EMT-2 providers should follow the BLS section and the EMT-2 section. EMT-3 providers should follow the BLS, EMT-2 and EMT-3 sections. MICPs should provide the care listed for all levels plus MICP.

#### **BLS**

- A. **Manage the airway and breathing and administer high flow O<sub>2</sub>.** Positive pressure may be needed to assist respirations (see **Airway** protocol).
- B. Consider the use of the **patient's prescribed epinephrine autoinjector** (see **Assisting with Medication** guidelines)
- C. Encourage patient to assume **position of comfort**. If in shock, lie supine. Sit up if in respiratory distress.
- D. Re-evaluate patient for changes every 2 minutes.

- E. In cases of bee stings, examine the sting site. If the stinger is present, do not grasp between fingers or with hemostat, tweezers or any kind of grasping device. Take any kind of flat-bladed object, such as a tongue depressor, and scrape along the skin to remove the venom sac.

### **EMT-2**

- F. **Manage the airway** according to the Advanced Airway Management protocol.
- G. Establish **one or two IVs of normal saline**.
1. Draw bloods if time allows.
  2. Use a macrodrip administration set.
  3. Largest catheter possible.
- H. If signs and or symptoms of shock are present, **run the IV solution wide open, reassessing vital signs after every 250 ml**. Watch for signs of circulatory overload.
1. Run the IV at TKO if signs and symptoms of shock resolve.
  2. For **children less than eight**, place an intraosseous catheter (**IO**) if IV access cannot be quickly obtained and the patient has a depressed level of consciousness so that the procedure is not extremely painful. Use **20ml/kg fluid boluses** in place of wide-open fluids. Reassess after every bolus and repeat PRN

### **EMT-3**

- I. **Monitor ECG lead II**.
- J. Administer **epinephrine (1:1,000) 0.3-0.5 mg, SQ** if:
1. Wheezing or stridor is present;
  2. Edema of the pharynx, soft palate or tongue is observed;
  3. Signs of shock are observed (such as hypotension, confusion, weak pulse or tachycardia)
    - a) May be repeated in 5-10 minutes PRN.
- K. Contact medical control and consider **epinephrine (1:10,000) 0.3-0.5 mg, IVP** if:
1. SQ epinephrine is ineffective
  2. The patient is in decompensated shock

### **MICP**

- L. If wheezing or stridor is present, **administer albuterol by metered dose inhaler or 2.5-5.0 mg by nebulizer**. Repeat until wheezing, cough, or prolonged expiratory phase are resolved.
- M. **Administer diphenhydramine, 25-50 mg, slow IVP**.
- N. **Consider methylprednisolone (Solumedrol) 125 mg IVP**
- O. **Consider** the use of **dopamine** if shock is unresponsive to fluids and epinephrine. This decision should be made after consulting with on-line medical control.

## ALTERED MENTAL STATUS

### I. GENERAL POINTS

- A. Altered mental status may be caused by many things including: decreased O<sub>2</sub> delivery to the brain, low blood sugar, alcohol intoxication, withdrawal from alcohol, drug use, hypothermia, a wound or injury, or tumors interfering with the brain's function.
- B. If the patient is diabetic, refer to the **Diabetes** protocol. If the patient had a seizure, refer to the **Seizure** protocol.
- C. Consider cold or other environmental causes.

### II. ASSESSMENT

- A. Determine the general mental status using the AVPU scale. Is the patient Alert or Awake? If not, then do they respond in any way to your Voice? If not, do they respond appropriately or inappropriately to Pain? If there is no response at all, the patient is considered Unresponsive.
- B. Test for motor, sensory, and circulation status in each extremity. If the patient is unconscious or does not respond appropriately, assess for pain response on both sides of the body. Decreased response on one side suggests a stroke or trauma.
- C. Assess and record vital signs. Determine whether the patient is improving or getting worse with each passing minute.
- D. Measure the Glasgow Coma Scale. See **Reference** section.
- E. Conduct focused history and physical examination.
  - 1. Question family or bystanders to gather present history (OPQRST and SAMPLE). Length of time unconscious, onset, associated symptoms, evidence of trauma, interventions, seizures, fever, position, blood in vomit or stool, incontinence, orthostatic vital signs.

### III. MANAGEMENT

Every provider should follow the BLS section. EMT-2 providers should follow the BLS section and the EMT-2 section. EMT-3 providers should follow the BLS, EMT-2 and EMT-3 sections. MICPs should provide the care listed for all levels plus MICP.

#### **BLS**

- A. **Immobilize** the entire **spine** if trauma is suspected.
- B. If the patient is not breathing adequately, **manage** the **airway** per the **Basic Airway Management** protocol.
- C. If patient is breathing adequately, **administer O<sub>2</sub>**, 10-15 lpm by nonrebreather mask. Use a nasal cannula at 1-6 lpm if the patient is agitated by the mask.
- D. Place patient in a **semi-sitting position** (head elevated 30°).
- E. The use of ammonia inhalants is contraindicated.
- F. **Consider** administration of one tube of **instant glucose**, if the patient has a history of diabetes and is alert enough to swallow.

### **EMT-2**

- G. **Defer intubation** until hypoglycemia and narcotic overdose have been ruled out as causes.
- H. Establish an **IV** of **normal saline TKO**.
- I. **Draw bloods** and perform **glucometry**. If the patient has a blood sugar (BG) reading < 80 mg/dl and has signs and symptoms consistent with hypoglycemia, administer **D50, 50 ml (25 grams), IVP**. If patient remains unconscious and BG < 80 mg/dl, repeat D50 25 gm once.
- J. If narcotic overdose is suspected, and the patient is unconscious and experiencing respiratory depression and/or hypotension, administer **naloxone, 0.4 to 2 mg, slow IVP or IM if no IV access**. It is preferable that the patient not be awakened in the field. Only administer enough naloxone to reverse respiratory depression and or hypotension.
- K. If the patient does not awaken after the above procedures, consider placement of an advanced airway as tolerated by level of consciousness.
- L. If signs and or symptoms of shock are present, **run the IV solution wide open, reassessing vital signs after every 250 ml**. Watch for signs of circulatory overload.
  - 1. Run the IV at TKO if signs and symptoms of shock resolve.
  - 2. For **children less than eight**, place an intraosseous catheter (**IO**) if IV access cannot be quickly obtained and the patient has a depressed level of consciousness so that the procedure is not extremely painful. Use **20ml/kg fluid boluses** in place of wide-open fluids. Reassess after every bolus and repeat PRN

### **EMT-3**

- M. **Monitor ECG** lead II. If a dysrhythmia is seen refer to the appropriate dysrhythmia protocol.

### **MICP**

- N. Follow dextrose administration with **thiamine, 100 mg**, slow **IVP** if the patient is believed to be malnourished.
- O. If unable to establish IV after two attempts and the patient is symptomatic, administer **Glucagon 1 mg IM**. If you suspect the patient is malnourished follow the glucagon with **Thiamine 100 mg IM**.
- P. Consider placement of an endotracheal tube (using rapid sequence intubation if the patient cannot be intubated otherwise).
- Q. Consider placing a foley catheter if the transport is delayed.

## **IV. SPECIAL CONSIDERATIONS**

- A. Delayed transport
  - 1. It is important that the EMT perform repeat mental status examinations on patients with altered mental status. This data will be an important factor when the receiving clinician is diagnosing the patient.

2. Repeat mental status examinations should be documented and forwarded with the patient. If you do not collect this information, it will be lost.
3. Always remember to make sure that a patient with altered mental status does not harm themselves or others.



## ASTHMA/COPD

### I. GENERAL POINTS

- A. This protocol is aimed at problems with the lower airway that cause respiratory distress. There are many causes of respiratory distress, the important point is being able to recognize and treat a patient in respiratory distress
- B. Crackles, jugular venous distension (JVD) and peripheral edema are indicative of cardiac-related respiratory distress. If noted, refer to the **Pulmonary Edema** protocol. If an allergic reaction, refer to the **Allergic Reaction/ Anaphylaxis** protocol. If upper respiratory, refer to the **Obstructed Airway** protocol.

### II. ASSESSMENT

- A. Signs and symptoms include; difficulty breathing, rapid or slow respiratory rate, anxiety, depressed level of consciousness, pallor, diaphoresis, cyanosis, retraction of intercostal spaces, accessory muscle use, deep or shallow ventilation, labored breathing, wheezing, coughing, absent breath sounds, and an inability to complete sentences or phrases without stopping to take a breath. Patients in respiratory distress are usually sitting upright and forward and do not tolerate lying down. Children who exhibit grunting and/or nasal flaring are in severe distress.
- B. Determine if there is a history of respiratory problems or other significant medical conditions such as a cardiac history.
- C. Obtain SAMPLE history and include prior history of respiratory emergencies, current medications prescribed/taken and onset, duration, progression of event.
- D. Patients may have difficulty speaking; try to phrase questions to allow for simple answers.

### III. MANAGEMENT

Every provider should follow the BLS section. EMT-2 providers should follow the BLS section and the EMT-2 section. EMT-3 providers should follow the BLS, EMT-2 and EMT-3 sections. MICPs should provide the care listed for all levels plus MICP.

#### **BLS**

- A. **Position patient** to ensure an open airway and maintain a position of comfort. A sitting position may reduce respiratory distress.
- B. **Suction as needed** to clear upper airway.
- C. If the patient is **not breathing adequately**, insert an **NPA or OPA** and assist breathing with a **bag-valve-mask**, supplied with 15 liters of O<sub>2</sub> or a flow restricted, O<sub>2</sub> powered ventilation device.
- D. If patient is **breathing adequately**, **administer O<sub>2</sub>**, 10-15 lpm by nonrebreather mask. Use a nasal cannula at 1-6 lpm if the patient is agitated by the mask. Do not withhold O<sub>2</sub> from a short of breath patient regardless of the medical history.
- E. **Reassure patient**. Don't overlook the value of calming and reassuring patient.
- F. **Search for causes** like trauma, anaphylaxis, and airway obstruction.

- G. If wheezes are heard, **consider** the use of the **patient's prescribed inhaler** (see **Assisting with Medications** guidelines)

### **EMT-2**

- H. Perform **endotracheal intubation as indicated** by the **Advanced Airway Management** protocol.
- I. Establish an **IV normal saline TKO** with a microdrip administration set. Draw bloods.

### **EMT-3**

- J. **Monitor ECG** lead II.
- K. For patients with signs and symptoms consistent with bronchoconstriction (wheezing, coughing, prolonged expiratory phase), asthmatics, chronic obstructive pulmonary disease patients, and patients with wheezing on exam, contact medical control and anticipate an order for **0.3-0.5 ml epinephrine 1:1,000 SQ. (use 0.01 mg/kg for pediatrics)**.
1. Consider epinephrine (1:10,000) 0.3-0.5 mg, IVP if SQ epinephrine is ineffective.

### **MICP**

- L. For patients with signs of bronchoconstriction (wheezing, coughing, prolonged expiratory phase); asthmatics; chronic obstructive pulmonary disease patients; and patients with wheezing on exam. Administer **albuterol 2.5 mg by nebulizer** at 4-6 liters per minute with tee piece or 6-10 liters per minute with facemask. **Repeat PRN in 20 minutes for total of three doses.**
- M. If signs of bronchoconstriction remain, **consider nebulized ipatropium 0.5 mg** in 2.5 ml of NS.
- N. If signs of bronchoconstriction remain, **consider 0.3-0.5 mg epinephrine IV or SQ. (use 0.01 mg/kg for pediatrics)**
- O. If transport time is prolonged, consult medical control and anticipate **125 mg methylprednisolone IVP every 6 hours. (Use 1-2mg/kg initially then 2 mg/kg every 6 hours for pediatrics)**.
- P. **Consider magnesium sulfate 2-4 g infused at 200 mg/min up to 1g/min.**

## **IV. SPECIAL CONSIDERATIONS**

- A. Delayed transport
1. If oxygen supply is limited, O<sub>2</sub> should be titrated to the patient's needs. If pulse oximetry is available, administer just enough O<sub>2</sub> to maintain SpO<sub>2</sub> greater than 95% or patient's normal. If not, give enough O<sub>2</sub> to relieve distress and reduce that amount to the minimum flow required to relieve distress.
- B. Pediatrics
1. The primary cause of cardiac arrest in children is respiratory distress. Prompt recognition and aggressive interventions are priorities in this population.

2. The child with upper respiratory obstruction should not be agitated as this may increase swelling and O<sub>2</sub> demand. Defer examination of the mouth and throat unless there is a clear indication of a foreign body.



## BEHAVIORAL EMERGENCIES

### I. GENERAL POINTS

- A. If there is a potential for violence, wait for law enforcement.
- B. Leave yourself an exit and trust your instincts if you feel threatened.
- C. Behavioral emergencies can have an underlying medical cause: head injury, seizure disorder, diabetes, alcohol/drug use, withdrawal, hypoxia, or other medical conditions.

### II. ASSESSMENT

- A. Scan scene for indications of suicide attempts or violent acts.
- B. Search for a possible medical cause for this incident. Be sure to identify and treat hypoxia, shock, and diabetes as possible causes.
- C. Introduce yourself and your role. Speak slowly and use a calm tone. Establish the patient's LOC. Ask questions to determine the patient's orientation to person, place, and time. Treat all life-threats immediately if scene is safe. Listen to the patient. Don't be judgmental. Use positive body language and, unless granted permission, do not enter the patient's personal space. Explain all procedures before doing them. Answer questions honestly and offer reassurance. Never lie.
- D. If suicide or violence is suspected, ask:
  - 1. Do you intend to hurt yourself or others?
  - 2. Have you had thoughts of killing yourself?
  - 3. Do you have a plan for killing yourself?
  - 4. Do you feel like life isn't worth living?
- E. If the answer is yes to any of the above questions, the patient should be encouraged to allow transportation to a medical facility for evaluation. If patient refuses, contact medical control. If medical control thinks the patient is a danger to self or others, law enforcement should be contacted. If unable to reach medical control, contact law enforcement.

### III. MANAGEMENT

Every provider should follow the BLS section. EMT-2 providers should follow the BLS section and the EMT-2 section. EMT-3 providers should follow the BLS, EMT-2 and EMT-3 sections. MICPs should provide the care listed for all levels plus MICP.

#### **BLS**

- A. Allow patient to assume a **position of comfort**.
- B. **Treat hypoxia, shock, overdose and diabetes PRN.**
- C. Carefully assess the patient as tolerated for signs and symptoms of illness or injury.
- D. Uncooperative patients that are not competent to refuse treatment may be restrained. Contact law enforcement. Follow **Restraint** protocol as indicated.

- E. Treat injuries as patient allows.

**MICP**

- F. **If patient is out of control**, and must be restrained, **consider administration of 5 mg haloperidol IM**. Repeat once PRN in 5 minutes. Following this, also **administer 25 mg diphenhydramine IVP**.

## CARDIAC ARREST

### I. GENERAL POINTS

- A. If the patient's condition meets the criteria identified in the **Death in the Field** protocol, refer to it for further instruction. Generally, resuscitation should not be started, or if already in progress should not be continued, if the patient's condition falls within the parameters of that protocol. Be alert for evidence of enrollment in the COMFORT ONE program.
- B. Be alert for environmental complications (e.g. hypothermia, cold water near drowning). If either is suspected, see **Cold Injuries** guidelines.
- C. Hypoxia and or shock usually cause pediatric arrest. This is very different from the adult arrest, which is usually cardiac in origin. Prevention of pediatric arrest is most important, as survival rates from cardiopulmonary arrest are dismal in children.
- D. If resuscitation is going to work, it generally will work on-scene. Treat the patient up to the level of your training before moving him or her to the ambulance and transporting to the hospital.

### II. ASSESSMENT

- A. Determine history. In case of cardiac arrest, the following information should be determined from bystanders or relatives whenever possible:
  - 1. Estimate the down time.
  - 2. When CPR was started and any changes in patient's condition or response to CPR.
  - 3. If an AED was used, how many times the patient was shocked.
  - 4. Patient's previous medical history, particularly where it may have been the cause of the arrest: (e.g., cardiac condition, respiratory problems, drug use/overdose, hypoglycemia, etc.).
  - 5. Patient's chief complaint, signs and symptoms preceding arrest.

### III. GENERAL MANAGEMENT

Every provider should follow the BLS section. EMT-2 providers should follow the BLS section and the EMT-2 section. EMT-3s and MICPs should follow the BLS and EMT-2 orders and then progress directly to the EMT-3 or MICP orders.

#### **BLS**

- A. Establish unresponsiveness.
- B. Determine lack of breathing AND pulse.
- C. Assure that the patient is supine on a firm surface.
- D. If not breathing, administer **positive pressure ventilation** at an age appropriate rate with 100% O<sub>2</sub>. Ensure a clear airway. Use **airway adjuncts**, and, if needed, **suction**.

- E. If no pulse, **apply AED** (see **AED** guidelines) **and start CPR**.
  - 1. Immediate defibrillation should take priority over virtually all other aspects of initial resuscitation (including CPR) since the sooner defibrillation is attempted, the more likely it is to be successful. Do not delay defibrillation to perform endotracheal intubation, place an IV or move the patient to the ambulance.
- F. **Transport** or arrange for an **ALS intercept**.
- G. **Contact medical control**.
  - 1. Discuss terminating efforts.
- H. **Consider termination** of efforts if the patient is NOT hypothermic and if:
  - 1. No immediate communication is available with medical control AND;
  - 2. CPR is performed for 30 minutes OR;
  - 3. ALS is provided for at least 30 minutes without a return of a spontaneous pulse.
- I. If resuscitation efforts are not producing positive results, review the basic steps that might be responsible: Are ventilation and oxygenation adequate? Is the bag-valve device attached to the O<sub>2</sub> supply? Are compressions being performed properly and effectively? Are pulses palpable with compressions?
- J. If the patient is resuscitated, assess pulse rate, respiratory rate and blood pressure. Be prepared to ventilate the patient until he or she is breathing adequately. Many post-arrest patients will vomit; have suction readily available.
- K. **Follow the appropriate protocol** for the patient's condition post-arrest i.e. respiratory distress, shock, etc.

### **EMT-2**

- L. **Place an endotracheal tube, dual lumen airway or laryngeal mask airway** per the **Advanced Airway Management** protocol. Pay particular attention to confirming and maintaining proper tube position.
- M. Establish **intravenous access** early in the resuscitative effort, although support of the airway, circulation and defibrillation must take priority. Use **normal saline macrodrip** administration set **TKO**.

### **EMT-3**

## IV. VENTRICULAR FIBRILLATION AND PULSELESS VENTRICULAR TACHYCARDIA-EMT-3

- A. One **precordial thump** may be delivered if the EMT witnessed the arrest and the defibrillator is not readily available.
- B. **Defibrillate at 200 joules**. If unsuccessful, immediately attempt a second defibrillation at **200-300 joules**. If unsuccessful, attempt a third immediate defibrillation at **360 joules**. Or use energy recommended by manufacturer of defibrillator.
  - 1. During the delivery of the three successive shocks, do not resume CPR unless there is some delay.

2. Do not pause for a pulse check if a properly connected ECG monitor clearly displays persistent VF/VT.
  - C. If not already in place, insert an **endotracheal tube and IV**.
  - D. Administer **epinephrine, 1 mg IVP** (or 2.0-2.5 mg, ETT). Repeat every 3 minutes.
  - E. **Defibrillate at 360 joules**, 30-60 seconds after every drug administration.
  - F. Administer **lidocaine, 1-1.5 mg/kg, IVP** (or 2.0-3.75 mg/kg, ETT). Repeat in 3-5 minutes to a total of 3 mg/kg has been administered. If patient is older than 70 years old, has compromised liver function, decreased cardiac output, etc., administer a single loading dose of **1 mg/kg**.
- V. PEDIATRIC VENTRICULAR FIBRILLATION AND PULSELESS VENTRICULAR TACHYCARDIA-EMT-3
- A. **Defibrillate at 2 joules/kg**. If unsuccessful, immediately attempt a second defibrillation at **4 joules/kg**. If unsuccessful, attempt a third immediate defibrillation at **4 joules/kg**.
    1. During the delivery of the three successive shocks, do not resume CPR unless there is some delay.
    2. Do not pause for a pulse check if a properly connected ECG monitor clearly displays persistent VF/VT.
  - B. If not already in place, insert an **endotracheal tube and IV or IO**.
  - C. Administer **epinephrine, 0.1 ml/kg IVP of 1:10,000 IV/IO or 0.1ml/kg 1:1,000 ETT**. Repeat IV/IO dose is **0.1ml/kg of 1:10,000** every 5 minutes.
  - D. **Defibrillate at 4 joules/kg**, 30-60 seconds after every drug administration. (About the time it takes to charge the defibrillator and position the paddles).
  - E. Administer **lidocaine, 1mg/kg, IVP** (or 2.0-3.75 mg/kg, ETT). Repeat in 3-5 minutes to a total of 3 mg/kg that has been administered. If child has compromised liver function or decreased cardiac output, administer a single loading dose of **1 mg/kg**.
  - F. Transport
- VI. PULSELESS ELECTRICAL ACTIVITY (PEA)-EMT-3
- A. Place an endotracheal tube, dual lumen airway or laryngeal mask airway and at least one **large bore IV**.
  - B. Administer **epinephrine, 1 mg** (10 ml), **IVP** (or 2.0-2.5 mg, ETT). Repeat administration every 3 minutes.
    1. For pediatrics, administer epinephrine, 0.1 ml/kg IVP of 1:10,000 IV/IO or 0.1ml/kg 1:1,000 ETT. Repeat IV/IO dose is 0.1ml/kg of 1:10,000 every 5 minutes.
  - C. If adult and heart rate is less than 60/min. administer **atropine, 1 mg, IVP** (or 2.0-2.5 mg, ETT). Repeat every 3-5 minutes to total 0.03-0.04 mg/kg.
  - D. Consider **running the IV of normal saline wide open**, unless the PEA is clearly from primary cardiac causes. Give 20 ml/kg to children. Repeat PRN.

- E. Perform differential diagnosis of PEA to identify and **address treatable causes** of PEA.
1. Mechanical Causes:
    - a) Poor CPR-**correct**
    - b) Tension pneumothorax-**transport**
    - c) Hypovolemia-**volume expansion**
    - d) Pericardial tamponade-**transport**
    - e) Massive Pulmonary embolism-**transport**
  2. Non-mechanical causes:
    - a) Hypoxia-**check interventions**
    - b) Acidosis, arrest generated-**ventilate** with 100% O<sub>2</sub>
    - c) Hypothermia-transport, **active rewarming**
    - d) Drug overdose-**transport**
    - e) Electrolyte imbalance-**transport**
- F. Transport.

## VII. ASYSTOLE-EMT-3

- A. Place an endotracheal tube, dual lumen airway or laryngeal mask airway and **large bore IV** (at least one).
- B. Administer **epinephrine, 1 mg IVP** (or 2.0-2.5 mg, ETT). Repeat administration every 3-5 minutes.
1. For pediatrics, administer epinephrine, 0.1 ml/kg IVP of 1:10,000 IV/IO or 0.1ml/kg 1:1,000 ETT. Repeat IV/IO dose is 0.1ml/kg of 1:10,000 every 5 minutes.
- C. For adults, administer **atropine, 1 mg, IVP** (or 2.0-2.5 mg, ETT). Repeat this dose after 3-5 minutes if no result. Total dose of 0.03-0.04 mg/kg.).
- D. Transport.

## VIII. POST-ARREST-EMT-3

- A. Criteria for this protocol:
1. Patient must have a supraventricular rhythm.
  2. Rate must be 60-150/min.
  3. Patient must have palpable pulse.
- B. If the patient was in VT/VF or significant premature ventricular complexes are present:( frequent, multiformed or R-on-T phenomenon, runs of PVC's (3 or more in a row), couplets (pairs of PVC's) an IV infusion of lidocaine should be started.
1. Administer a **lidocaine** infusion at **2-4 mg/min**.
    - a) Following the bolus given to maintain therapeutic levels of the medication or;
    - b) alone if last bolus was given <15 minutes before termination of VF/VT.

2. For pediatric post ventricular arrest administer lidocaine 20-50 µg/kg/minute infusion IV/IO.
  3. If **lidocaine** was not previously given during the resuscitation, administer a bolus of **1 mg/kg, IVP** (or 2.0-3.75 mg/kg, ETT).
    - a) Use lower doses (0.5-0.75 mg/kg) and longer intervals in patients 70 years of age or older, liver failure, heart failure, and/or smaller body size.
- C. Transport.

### **MICP**

#### IX. VENTRICULAR FIBRILLATION AND PULSELESS VENTRICULAR TACHYCARDIA-MICP

- A. One **precordial thump** may be delivered if the MICP witnessed the arrest and the defibrillator is not readily available.
- B. **Defibrillate at 200 joules.** If unsuccessful, immediately attempt a second defibrillation at **200-300 joules.** If unsuccessful, attempt a third immediate defibrillation at **360 joules.** Or use energy recommended by manufacturer of defibrillator.
  1. During the delivery of the three successive shocks do not resume CPR unless there is some delay.
  2. Do not pause for a pulse check if a properly connected ECG monitor clearly displays persistent VF/VT.
- C. If not already in place, insert an **endotracheal tube and IV.**
- D. Administer **epinephrine, 1 mg IVP** (or 2.0-2.5 mg, ETT). Repeat every 3 minutes **or vasopressin 40 IU IVP.**
- E. **Defibrillate at 360 joules,** 30-60 seconds after every drug administration.
- F. Administer an **antiarrhythmic**:
  1. **lidocaine, 1-1.5 mg/kg, IVP** (or 2.0-3.75 mg/kg, ETT). Repeat in 3-5 minutes to a total of 3 mg/kg. If patient is older than 70 years old, has compromised liver function, administer a single loading dose of **1 mg/kg**
  2. **or; amiodarone 300 mg IVP**
  3. **or; procainamide 50 mg/min** to max dose of 17mg/kg
  4. **or; for known hypomagnesemia or torsades de pointes, magnesium sulfate 1-2 gm IVP** over 1-2 minutes.
- G. Transport.

#### X. PEDIATRIC VENTRICULAR FIBRILLATION AND PULSELESS VENTRICULAR TACHYCARDIA-MICP

- A. This is a rare arrest rhythm in children (10%). Suspect cardiac injury or disease if this rhythm presents.

- B. **Defibrillate at 2 joules/kg.** If unsuccessful, immediately attempt a second defibrillation at **4 joules/kg.** If unsuccessful, attempt a third immediate defibrillation at **4 joules/kg.**
  - 1. During the delivery of the three successive shocks do not resume CPR unless there is some delay.
  - 2. Do not pause for a pulse check if a properly connected ECG monitor clearly displays persistent VF/VT.
- C. If not already in place, insert an **endotracheal tube and IV or IO.**
- D. Administer **epinephrine, 0.1 ml/kg IVP of 1:10,000 IV/IO or 0.1ml/kg 1:1,000 ETT. Repeat IV/IO dose is 0.1ml/kg of 1:10,000** every 5 minutes.
- E. **Defibrillate at 4 joules/kg, 30-60 seconds after every drug administration.**
- F. Administer an antiarrhythmic:
  - 1. **lidocaine, 1 mg/kg, IVP** (or 2.0-3.75 mg/kg, ETT). Repeat in 3-5 minutes to a total of 3 mg/kg. If patient has compromised liver function, administer a single loading dose of **1 mg/kg**
  - 2. **or; amiodarone 5 mg/kg IVP.**
  - 3. for known **hypomagnesemia or torsades de pointes, magnesium sulfate 25-50 mg/kg up to 2 gm IVP.**
- G. Transport

#### XI. PULSELESS ELECTRICAL ACTIVITY (PEA) -MICP

- A. Place an endotracheal tube, dual lumen airway or laryngeal mask airway and **large bore IV** (at least one).
- B. Administer **epinephrine, 1 mg** (10 ml) **IVP** (or 2.0-2.5 mg, ETT). Repeat administration every 3-5 minutes.
  - 1. For pediatrics, administer epinephrine, 0.1 ml/kg IVP of 1:10,000 IV/IO or 0.1ml/kg 1:1,000 ETT. Repeat IV/IO dose is 0.1ml/kg of 1:10,000 every 5 minutes.
- C. If adult and heart rate < 60/min. administer **atropine, 1 mg, IVP** (or 2.0-2.5 mg, ETT). Repeat every 3-5 minutes to total 0.03-0.04 mg/kg.
- D. Consider **running the IV of normal saline wide open**, unless the PEA is clearly from primary cardiac causes.
- E. Perform differential diagnosis of PEA to identify and **address treatable causes** of PEA
  - 1. Mechanical causes:
    - a) Poor CPR-**correct**
    - b) Tension Pneumothorax-**needle decompression**
    - c) Hypovolemia-**volume expansion**
    - d) Pericardial tamponade- **volume expansion, pericardiocentesis if delayed or prolonged transport.**
    - e) Massive Pulmonary embolism-**transport**
  - 2. Non-mechanical causes:

- a) Hypoxia-**check interventions**
- b) Metabolic Acidosis
  - (1) *preexisting-give **1mEq/kg sodium bicarbonate IVP***
  - (2) *arrest generated-**ventilate** with 100% O<sub>2</sub>*
- c) Hypothermia-transport, **active rewarming**
- d) Drug overdose
  - (1) *tricyclic antidepressants-**1mEq/kg sodium bicarbonate IVP***
  - (2) *beta blockers-increase dose of **epinephrine to 10 mg IVP, administer glucagon 3-5 mg IVP.***
  - (3) *digitalis-transport*
  - (4) *calcium channel blockers-give **1,000 mg of calcium chloride slow IVP; administer glucagon 3-5 mg IVP.***
- e) Electrolyte imbalance
  - (1) *hyperkalemia-give **sodium bicarbonate, and glucose***
  - (2) *hypocalcemia-give **calcium chloride***

F. Transport.

## XII. ASYSTOLE-MICP

- A. Place an endotracheal tube, dual lumen airway or laryngeal mask airway and **large bore IV** (at least one).
- B. Consider **external pacing**. Success unlikely, early if ever.
- C. Administer **epinephrine, 1 mg IVP** (or 2.0-2.5 mg, ETT). Repeat administration every 3-5 minutes.
  - 1. For pediatrics, administer epinephrine, 0.1 ml/kg IVP of 1:10,000 IV/IO or 0.1ml/kg 1:1,000 ETT. Repeat IV/IO dose is 0.1ml/kg of 1:10,000 every 5 minutes.
- D. For adults, administer **atropine, 1 mg, IVP** (or 2.0-2.5 mg, ETT). Repeat this dose after 3-5 minutes if no result. Total dose of 0.03-0.04 mg/kg.).
- E. Transport.

## XIII. POST-ARREST-MICP

- A. Criteria for this protocol:
  - 1. Patient must have a supraventricular rhythm.
  - 2. Rate must be 60-150/min.
  - 3. Patient must have palpable pulse.
- B. If the patient was in VT/VF or significant premature ventricular complexes are present: (frequent, multiformed or R-on-T phenomenon, runs of PVC's (3 or more in a row), couplets (pairs of PVC's), an **IV infusion** of the **successful antiarrhythmic** should be administered. Administer maintenance infusion alone if bolus drug was given within 15 minutes. Be mindful of maximum dose and total dose administered.
  - 1. **lidocaine**

- a) Administer a **lidocaine** infusion at **2-4 mg/min**.
  - (1) *Following the bolus given to maintain therapeutic levels of the medication or;*
  - (2) *alone if last bolus was given <15 minutes before termination of VF/VT.*
- b) For pediatric post ventricular arrest administer lidocaine 20-50 µg/kg/minute infusion IV/IO.
- c) If **lidocaine** was not previously given during the resuscitation, administer a bolus of **1 mg/kg, IVP** (or 2.0-3.75 mg/kg, ETT).
  - (1) *Use lower doses (0.5-0.75 mg/kg) and longer intervals in patients 70 years of age or older, liver failure, heart failure, and/or smaller body size.*
- 2. **or; procainamide 20-30 mg/min** (unless underlying heart function is impaired) until; arrhythmia resolves, hypotensive, QRS widens 50 % of its original width, or max dose of 17 mg/kg is administered. Start maintenance infusion at 1-4 mg/min if successful.
  - a) To give 20 mg/min. put 1 gm in 50 ml NS. Use a microdrip set and run at 60 gtts/min. To give 30 mg/min run at 90 gtts/min.
- 3. **or; amiodarone** 150 mg IV infusion over 10 minutes followed by an infusion of 1mg/min for six hours then 0.5 mg/min over next 18 hours.
- C. Check the patient's blood pressure. If BP is below 100mmHg, and the patient has signs or symptoms of shock, **administer dopamine** drip at **5 -15 µg/kg/min**. Titrate drip rate to systolic blood pressure >100 mmHg.
- D. If SVT or bradycardia with accompanying hypotension is seen, the paramedic should follow that specific protocol.
- E. Transport.

#### XIV. TRANSPORT-ALL LEVELS

- A. Place patient onto a full backboard or alternative and secure with at least two straps. Move the patient (and backboard) to the cot when appropriate.
- B. Check ET placement every time patient is moved.
- C. Continue CPR without more than 20 seconds interruption (e.g., to measure and insert the airway, etc.).

## CHEST PAIN

### I. GENERAL POINTS

- A. Objectives for treatment of chest pain patient are: reduce anxiety, decrease myocardial O<sub>2</sub> demand, increase O<sub>2</sub> supply to the tissues, minimizing infarct size, and careful, and quiet (no lights or siren) transport to the hospital.
- B. Chest pain may be a symptom of cardiac ischemia or infarction, or it may be related to other conditions. When in doubt, err on the side of assuming the pain is cardiac.
- C. Consider other life-threatening causes of chest pain such as aortic dissection, pneumothorax, or pulmonary embolus.
- D. Chest pain in children is rarely cardiac related. Look for other causes.

### II. ASSESSMENT

- A. Cardiac chest pain is described as crushing heaviness, dull pressure to substernal or epigastric area that may radiate to the jaw or arms. It is often referred to as a discomfort rather than pain. It may be associated with heavy meals, exercise, or stress. Other symptoms may include nausea, vomiting, syncope, dizziness, cool/clammy skin, and diaphoresis. Be aware that female patients may not exhibit classic signs and symptoms.
  - 1. Onset – what were you doing when this started?
  - 2. Provoking/palliative factors – Does anything make it better or worse?
  - 3. Quality – what does it feel like?
  - 4. Radiation – does it go anywhere?
  - 5. Severity-1-10 scale.
  - 6. Time-how long?
- B. Assess bilateral breath sounds. Be alert for pulmonary edema. Check the extremities for edema, presence of equal pulses, and check the abdomen for pulsation, swelling and rigidity.
- C. The triad of hypotension, dry lungs, and JVD in the setting of chest pain is strongly suspicious for right heart failure. Perfusion in these patients is dependent on adequate filling of the heart. Nitroglycerin should be avoided, and fluid boluses may be needed to maintain blood pressure.

### III. MANAGEMENT

Every provider should follow the BLS section. EMT-2 providers should follow the BLS section and the EMT-2 section. EMT-3 providers should follow the BLS, EMT-2 and EMT-3 sections. MICPs should provide the care listed for all levels plus MICP.

#### **BLS**

- A. If the patient is not breathing adequately, **manage** the **airway** per the **Basic Airway Management** protocol.

- B. If patient is breathing adequately, **administer O<sub>2</sub>**, 10-15 lpm by nonrebreather mask. Use a nasal cannula at 1-6 lpm if the patient is agitated by the mask.
- C. Let patient maintain a **position of comfort** if no trauma suspected
- D. Give **aspirin 160-325 mg** by mouth
- E. Determine if patient has taken his or her prescribed nitroglycerin (see **Assisting with Medications** guidelines).
  - 1. Be prepared to **assist** with **administration of nitroglycerin-one 0.4 mg tablet** (or spray) SL every 5 minutes until pain is resolved or three doses have been given. Document time, dose, route, and effects.

### **EMT-2**

- F. **Start an IV NS TKO**, use a macrodrip administration set. Draw bloods.
- G. **If the patient is hypotensive with dry lungs and JVD, administer a 250cc fluid bolus and reassess.** Repeat if the patient remains hypotensive with dry lungs. Repeat as needed to maintain BP >100 systolic. If pulmonary edema develops, do not administer additional fluid boluses.

### **EMT-3**

- H. **Monitor ECG lead II.** Follow appropriate protocol if dysrhythmia is seen.
- I. The goal of pharmacologic treatment of chest pain is total pain relief. Continue to administer medications as indicated until the pain is totally gone even if earlier treatments reduced the pain.
- J. Prophylactic lidocaine is not indicated for chest pain.
- K. Recheck the patient's blood pressure. If the chest pain persists and the patient is not hypotensive, administer **morphine sulfate, 2-4 mg, slow IVP**, repeated after 5 minutes titrated to pain relief.

### **MICP**

- L. Obtain a **12 lead EKG** if possible. Report results of this field EKG to the receiving hospital prior to arrival.
- M. **Administer nitroglycerin 0.4 mg**, sublingually if the patient is not hypotensive (blood pressure > 90 mm Hg systolic).
  - 1. If the chest pain is not relieved, repeat administration of **nitroglycerin 0.4 mg**, sublingually every five minutes until chest pain is relieved (if the patient is not hypotensive). Recheck blood pressure after every dose.
  - 2. **Consider** using **nitroglycerin paste** if repeated doses of SL nitroglycerin are required for pain control. One inch is a starting dose.
- N. **Contact medical control.**
  - 1. **Consider labetalol 10 mg IVP** over 1-2 minutes.
  - 2. **Consider enoxaparin 1 mg/kg.**
- O. Out of hospital fibrinolysis may be appropriate for services with greater than a 60 minute transport time. A bolus dose agent should be used.

## IV. TRANSPORT

- A. It is important that safe, rapid transport be initiated; many treatments are predicated upon early interventions. Handle patient gently, do not increase anxiety level or allow patient to exert himself. Do not use lights and sirens unless absolutely necessary-they will increase the anxiety of the patient and increase the heart's need for O<sub>2</sub>.



## DIABETES

### I. GENERAL POINTS

- A. The diabetic has a problem getting glucose into the cells because of a lack of insulin. This problem is controlled by diet, oral medication, or injected medication.
- B. Diabetic emergencies are caused by a blood glucose level that is either too high from the diabetes (hyperglycemia), or too low from treatment and not enough calorie intake (hypoglycemia).
- C. Hyperglycemia is harmful to a patient suffering a stroke. If a patient exhibits signs of a stroke (such as slurred speech, drooping mouth, one-sided weakness, etc.), do not administer D<sub>50</sub>W or glucagon unless there is other evidence to support the diagnosis of hypoglycemia (e.g. recent administration of insulin and a low field glucose measurement.). If there is any suspicion of a stroke and glucose is normal or high, do not administer D<sub>50</sub>W or glucagon.

### II. ASSESSMENT

- A. Consider diabetic emergencies in any patient with an altered level of consciousness. Confusion, stupor, or coma can result from either hypoglycemia or hyperglycemia. Seizures may also occur in either condition.
- B. Many diabetic patients use home blood glucose measuring devices (e.g. Glucometer, Glucoscan, etc.). If they have such a device, ask when it was used and what the measurement was.
- C. Check the patient's medications. Determine time and dosage of last medication, time of last meal, any recent illness or injury, and if there has been any vomiting, especially if it occurred after insulin.
- D. Ask about excessive thirst, excessive fluid intake, and excessive urine output.

### III. MANAGEMENT

Every provider should follow the BLS section. EMT-2 providers should follow the BLS section and the EMT-2 section. EMT-3 providers should follow the BLS, EMT-2 and EMT-3 sections. MICPs should provide the care listed for all levels plus MICP.

#### **BLS**

- A. If the patient is not breathing adequately, **manage** the **airway** per the **Basic Airway Management** protocol.
- B. If patient is breathing adequately, **administer O<sub>2</sub>**, 10-15 lpm by nonrebreather mask. Use a nasal cannula at 1-6 lpm if the patient is agitated by the mask.
- C. **Suction** the airway of the unconscious patient **as needed** to remove secretions.
- D. Allow patient to assume a **position of comfort**. If the patient is unconscious place in a supine position.

- E. If hypoglycemia is suspected and the patient is alert enough to swallow, **administer one tube of oral glucose**. Patient must be conscious. If the patient cannot swallow, DO NOT give oral glucose. Observe and record the response to any glucose administration. If no response after 5 minutes, administer one additional tube of instant glucose.

### **EMT-2**

- F. **Defer intubation** until hypoglycemia has been ruled out or corrected.
- G. Establish an **IV** of **normal saline TKO**
1. Suspect dehydration in hyperglycemic patients. Run the IV wide open, reassessing vital signs after each 250 ml.
- H. **Draw bloods** and perform **glucometry**. If the patient has a blood sugar (BG) reading < 80 mg/dl and has signs and symptoms consistent with hypoglycemia, administer **D<sub>50</sub>W, 50 ml (25 grams), IVP**. If blood sugar remains low and signs and symptoms continue, repeat the above steps once.
1. For **pediatric patients**, administer **25% dextrose, 2-4 ml/kg IV**. For the patient with high blood sugar and signs of shock, give a 20 ml/kg IV bolus of NS. To make D<sub>25</sub>W, expel 25 ml from prefilled 50 ml D<sub>50</sub>W syringe and refill with 25 ml of normal saline.
- I. If the patient does not awaken after the above procedures, **consider** placement of an **endotracheal tube** as indicated and tolerated by level of consciousness.

### **EMT-3**

- J. **Monitor ECG** lead II. If a dysrhythmia is seen, refer to the appropriate **Dysrhythmia** protocol.

### **MICP**

- K. Follow dextrose administration with **thiamine, 100 mg**, slow **IVP** if the patient is believed to be malnourished.
- L. If **unable to establish IV** after two attempts and the patient is symptomatic, administer **Glucagon 1 mg IM**. If you suspect the patient is malnourished, precede the glucagon with **Thiamine 100 mg IM**.
- M. If the patient is unable to maintain his or her airway, consider placement of an endotracheal tube (with rapid sequence intubation if the patient cannot be intubated otherwise).
- N. Consider placing a foley catheter if the transport is delayed.

## **IV. TRANSPORT**

- A. Many confused hypoglycemic patients who become alert after glucose administration will refuse further treatment and transport. Medical control should be consulted during the decision-making process in these cases.

## DYSRHYTHMIAS

### I. GENERAL POINTS

- A. This protocol includes orders and procedures for treating serious dysrhythmias commonly addressed in Advanced Cardiac Life Support training that are producing a pulse. If there is no pulse, refer to the **Cardiac Arrest** protocol.
- B. **Do not delay initial defibrillation for intubation.**
- C. If the patient's rhythm converts with a given treatment, there is no need to progress to the next level (e.g., if the first round of atropine converts a bradycardic rhythm do not administer a second dose).

### II. ASSESSMENT

- A. A dysrhythmia is likely present if the pulse is irregular, slow, or fast.
- B. Only treat those patients who are symptomatic from the dysrhythmia. Symptomatic patients are those who have any, some, or all of the following: palpitations, shortness of breath, chest pain, symptoms of hypotension, altered mental status.
- C. The cardiac monitor should be applied and a paper strip recorded before treatment is initiated. If the patient loses the pulse, proceed to the **Cardiac Arrest** protocol.

### III. MANAGEMENT

Every provider should follow the BLS section. EMT-2 providers should follow the BLS section and the EMT-2 section. EMT-3s and MICPs should follow the BLS and EMT-2 orders and then progress directly to the EMT-3 or MICP orders.

#### **BLS**

- A. **Calm the patient** and provide continual reassurance.
- B. If the patient is not breathing adequately, **manage** the **airway** per the **Basic Airway Management** protocol.
- C. If patient is breathing adequately, **administer O<sub>2</sub>**, 10-15 lpm by nonrebreather mask. Use a nasal cannula at 1-6 lpm if the patient is agitated by the mask.
- D. **Position patient** in the most comfortable position. Sitting upright - if they are having trouble breathing. Supine with legs elevated - if they are hypotensive.
- E. Transport to the hospital quietly (no lights and siren) and promptly.

### IV. PEDIATRIC BRADYCARDIA

- A. Bradycardia in children up to age 8 is often a sign of **hypoxia**. **Ensure the child is well oxygenated** before any other treatment.
- B. If heart rate is **less than 60 bpm** and child has poor perfusion **start chest compressions**.

## **EMT-2**

- C. Perform **endotracheal intubation as indicated** by the Advanced Airway Management protocol.
- D. Place an **IV NS TKO**. Use a microdrip **administration set**. Draw bloods.

## **EMT-3**

### V. BRADYCARDIA-EMT-3

- A. **If asymptomatic**, provide needed basic and advanced care, **observe and transport**.
- B. Administer **atropine, 0.5-1.0 mg, IVP**. Can repeat every 3-5 minutes to a maximum 0.03-0.04 mg/kg.
- C. Transport.

### VI. PEDIATRIC BRADYCARDIA-EMT-3

- A. Ensure adequate ventilation.
- B. Establish **IV/IO NS TKO**.
- C. **Administer epinephrine 0.1 ml/kg 1:10,000 IV/IO push**. Repeat every 3-5 min PRN.
- D. **Consider atropine 0.02 mg/kg IV/IO push** if epinephrine is not effective. Repeat once PRN. Max single dose 0.5 mg. Minimum dose 0.1 mg.
- E. Transport.

### VII. PEDIATRIC TACHYCARDIA-EMT-3

- A. Narrow QRS (less than or equal to 0.08 sec)
  - 1. **If patient is asymptomatic** with evidence of adequate perfusion, provide needed basic and advanced care, **observe and transport**.
  - 2. Determine if the rhythm is sinus tachycardia (ST) or supraventricular tachycardia (SVT). **Treat ST by addressing the causes**.
    - a) ST in children usually has a history consistent with tachycardia. Look for fever, pain, volume loss, hypoxia, and ingestions. The rate is usually <220 bpm in infants and <180 bpm in children. The R-R interval usually varies in ST. P waves are likely to be seen.
    - b) SVT will often have a vague non-specific history. The rate is generally >220 in infants and >180 bpm in children. The R-R interval in SVT is generally fixed and does not change with respiration, crying or pain. P waves are not seen or are abnormal.
- B. Wide QRS (>0.08 sec) assume Ventricular Tachycardia (VT)
  - 1. **If patient is asymptomatic** with evidence of adequate perfusion, provide needed basic and advanced care, **observe and transport**.
  - 2. **Consult medical control**.
  - 3. Establish IV/IO NS TKO.

4. **Consider lidocaine 1mg/kg IV/IO push.** Repeat in 5 min. PRN up to max dose of 3 mg/kg.
  - a) If successful, start lidocaine infusion 20-50 µg/kg/min. To mix, multiply 60 x body weight in kg this is mg to add to 100 ml bag of NS and remove from bag to make total of 100 ml. 1 ml/hour gives 10 µg/min
5. Transport.

VIII. PREMATURE VENTRICULAR COMPLEXES (PVC'S) -EMT-3

- A. If patient is **asymptomatic** with evidence of adequate perfusion, provide needed basic care, **observe and transport.**
- B. **Ensure** the patient is **well oxygenated** and that cardiac **chest pain has been relieved.**
- C. Pharmacologic treatment for isolated PVCs is rarely indicated.
  1. Consult medical control.
- D. Transport.

IX. SUPRAVENTRICULAR TACHYCARDIA (SVT) -EMT-3

- A. Provide needed basic care, **observe and transport.**

X. WIDE COMPLEX TACHYCARDIA-UNCERTAIN TYPE (WCT) -EMT-3

- A. **Contact medical control.**
  1. **Consider lidocaine, 1.0-1.5 mg/kg, IVP.** If WCT persists, **repeat lidocaine at half the initial dose (0.5-0.75 mg/kg)** every 2-10 minutes until **3 mg/kg total** has been administered. Use lower doses and longer intervals for patients 70 years of age or older, liver failure, heart failure, and/or smaller body size. Following the successful lidocaine bolus, administer a **lidocaine** infusion at **1-4 mg/min.**
- B. Transport.

XI. VENTRICULAR TACHYCARDIA WITH A PULSE-EMT-3

- A. **Contact medical control.**
  1. **Consider lidocaine, 1.0-1.5 mg/kg, IVP.** If VT persists, **repeat lidocaine at half the initial dose (0.5-0.75 mg/kg)** every 2-10 minutes until **3 mg/kg total** has been administered. Use lower doses and longer intervals for patients 70 years of age or older, liver failure, heart failure, and/or smaller body size. Following the successful lidocaine bolus, administer a **lidocaine** infusion at **1-4 mg/min.**
- B. Transport

## **MICP**

### XII. BRADYCARDIA-MICP

- A. If **asymptomatic**, do not increase heart rate, but rather, provide needed basic and advanced care, **observe and transport**.
- B. If patient is bradycardic and does not have a 2° type II or 3° heart block, administer **atropine, 0.5-1.0 mg, IVP**. Repeat every 3-5 minutes to a maximum 0.03-0.04 mg/kg.
- C. Initiate **transcutaneous pacing (TCP)**. TCP may be administered as soon as available and may precede atropine.
  - 1. The patient may be sedated as needed. Use **diazepam 2-5 mg slow IVP** titrated to relief of anxiety up to max of 10 mg **or** use **midazolam 1-2 mg slow IVP** titrated to relief of anxiety up to max of 5 mg.
- D. If TCP is unsuccessful, start **dopamine infusion at 5-20 µg/kg/min**. Titrate to systolic BP >90 mm Hg.
- E. If all other interventions are unsuccessful, start **epinephrine infusion at 2-10 µg/min**. Titrate to achieve a pulse rate 60-80 BPM.
- F. Transport.

### XIII. PEDIATRIC BRADYCARDIA-MICP

- A. Bradycardia in children is often a sign of hypoxia. **Ensure the child is well oxygenated** before any other treatment.
- B. If heart rate is **less than 60 bpm** and child has poor perfusion **start chest compressions**.
- C. Establish **IV/IO NS TKO**.
- D. **Administer epinephrine 0.1 ml/kg 1:10,000 IV/IO push**. Repeat every 3-5 min PRN.
- E. **Consider atropine 0.02 mg/kg IV/IO push** if epinephrine is not effective. Repeat once PRN. Max single dose 0.5 mg. Minimum dose 0.1 mg.
- F. Consider external pacing.
- G. Transport.

### XIV. PEDIATRIC TACHYCARDIA-MICP

- A. Narrow QRS (less than or equal to 0.08 sec)
  - 1. If patient is **asymptomatic** with evidence of adequate perfusion, do not decrease heart rate but rather, provide needed basic and advanced care, **observe and transport**.
  - 2. Determine if the rhythm is sinus tachycardia (ST) or supraventricular tachycardia (SVT). Treat ST by addressing the causes. Treat SVT as listed below.

- a) ST in children usually has a history consistent with tachycardia. Look for fever, pain, volume loss, hypoxia, and ingestions. The rate is usually <220 bpm in infants and <180 bpm in children. The R-R interval usually varies in ST. P waves are likely to be seen.
    - b) SVT will often have a vague non-specific history. The rate is generally >220 in infants and >180 bpm in children. The R-R interval in SVT is generally fixed and does not change with respiration, crying or pain. P waves are not seen or are abnormal.
  3. **SVT Adequate perfusion**
    - a) **Attempt vagal maneuvers.**
      - (1) *Valsalva*
      - (2) *Immerse face in ice water.*
    - b) Give **adenosine, 0.1mg/kg, rapid IV push** (over 1-3 sec.). This dose and subsequent doses should be immediately followed with a 5 ml IV solution flush. If no conversion after 1-2 minutes, **repeat with 0.2 mg/kg rapid IV push** (double the initial dose).
    - c) Transport.
  4. **SVT Inadequate perfusion**
    - a) If an IV/IO is in place give adenosine as above.
    - b) Deliver **synchronized cardioversion at 0.5 joules/kg**. Do not delay cardioversion to start IV/IO or sedate the patient. **Repeat at 1.0 and then 2.0 joules/kg** if unsuccessful. If unsuccessful, reconsider diagnosis of SVT.
      - (1) *If an IV is already in place and it will not cause a significant delay, the patient may be sedated as needed. Contact medical control for orders.*
    - c) Transport.
- B. Wide QRS (>0.08 sec) assume Ventricular Tachycardia (VT)
1. **If patient is asymptomatic** with evidence of adequate perfusion, do not decrease heart rate but rather, provide needed basic and advanced care, **observe and transport.**
  2. **Adequate perfusion**
    - a) Establish **IV/IO NS TKO.**
    - b) Consult medical control
    - c) **Consider an antiarrhythmic:**
      - (1) ***lidocaine 1mg/kg IV/IO push. Repeat in 5 min. PRN up to max dose of 3 mg/kg. If successful, start lidocaine infusion at 20-50 µg/kg/min;***
        - (a) *To mix, multiply 60 x body weight in kg this is mg to add to 100 ml bag of NS and remove from bag to make total of 100 ml. 1 ml/hour gives 10 µg/min*
      - (2) ***or; amiodarone 5 mg/kg IV infusion over 30 to 60 minutes.***
      - (3) ***or; procainamide 15 mg/kg over 15-30 minutes.***

- d) Transport.
- 3. **Inadequate perfusion**
  - a) Deliver **synchronized cardioversion at 0.5 joules/kg**. Do not delay cardioversion to start IV/IO or sedate the patient. If unsuccessful, **repeat at 1.0 then 2.0 joules/kg PRN**.
    - (1) *If an IV is already in place and it will not cause a significant delay, the patient may be sedated as needed. Contact medical control for orders.*
  - b) Transport.

#### XV. PREMATURE VENTRICULAR COMPLEXES (PVC'S)-MICP

- A. If patient is **asymptomatic** with evidence of adequate perfusion, provide needed basic and advanced care, **observe and transport**.
- B. If the patient is bradycardic, increase the rate per the bradycardia section and then administer antiarrhythmic therapy as indicated.
- C. PVC's are very unusual in pediatric patients, usually as a result of hypoxia, and generally do not need treatment. Consult medical control.
- D. **Ensure** the patient is **well oxygenated** and that cardiac **chest pain has been relieved**.
- E. Pharmacologic treatment for isolated PVCs is rarely indicated.
- F. Consult with medical control.
- G. Transport.

#### XVI. SUPRAVENTRICULAR TACHYCARDIA (SVT)-MICP

- A. If patient is **asymptomatic** with evidence of adequate perfusion, do not decrease heart rate but rather, provide needed basic and advanced care, **observe and transport**.
- B. Determine if the patient is stable or unstable. If the patient is hypotensive, dyspneic, complaining of chest pain or has altered mental status, he or she is considered unstable. Follow the appropriate section for stable and unstable patients.
- C. **Stable Patient**
  - 1. Perform Valsalva maneuver or **carotid massage\***.
  - 2. If unsuccessful, give **adenosine, 6 mg** (over 1-3 sec.), rapid IV push. This dose and subsequent doses should be immediately followed with a 20 ml IV solution flush. If no conversion after 1-2 minutes, repeat with **12 mg** (double the initial dose). May repeat at **12 mg** one more time after 1-2 minutes.
  - 3. If SVT persists after vagal maneuvers, and adenosine, consult with medical control and consider synchronized cardioversion or beta-blockers, calcium channel blockers, and digoxin.
  - 4. Transport.

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\* Contraindicated in patients over 40 years old or those with carotid bruit.

D. **Unstable Patient**

1. Deliver **synchronized cardioversion at 50 joules; increase dose PRN to 100 joules then 200 joules; 300 joules; 360 joules.** Do not delay cardioversion to start IV or sedate the patient.
  - a) If an IV is already in place and it will not cause a significant delay, the patient may be sedated as needed. Use **diazepam 2-5 mg slow IVP** titrated to relief of discomfort up to max of 10 mg **or use midazolam 1-2 mg slow IVP** titrated to relief of discomfort up to max of 5 mg.
2. Transport.

XVII. WIDE COMPLEX TACHYCARDIA-UNCERTAIN TYPE (WCT)-MICP

- A. Determine if the patient is stable or unstable. If the patient is hypotensive, dyspneic, complaining of chest pain or has altered mental status, he or she is considered unstable. Follow the appropriate section for stable and unstable patients.
- B. **Stable Patient**
  1. Consult medical control.
    - a) **Consider procainamide 20-30 mg/min** (unless underlying heart function is impaired) until; arrhythmia resolves, hypotensive, QRS widens 50 % of its original width, or max dose of 17 mg/kg is administered. Start maintenance infusion at 1-4 mg/min if successful.  
*(1) To give 20 mg/min. put 1 gm in 50 ml NS. Use a microdrip set and run at 60 gtts/min. To give 30 mg/min run at 90 gtts/min.*
    - b) **or; consider amiodarone** 150 mg IV infusion over 10 minutes followed by an infusion of 1mg/min for six hours then 0.5 mg/min over next 18 hours.
  2. Transport.
- C. **Unstable patient**
  1. Deliver **synchronized cardioversion at 100 joules; increase dose PRN to 200 joules then 300 joules; then 360 joules.** Do not delay cardioversion to start IV or sedate the patient.
    - a) If an IV is already in place and it will not cause a significant delay, the patient may be sedated as needed. Use **diazepam 2-5 mg slow IVP** titrated to relief of discomfort up to max of 10 mg **or use midazolam 1-2 mg slow IVP** titrated to relief of discomfort up to max of 5 mg.
  2. **Consider an antiarrhythmic** after successful cardioversion.
  3. Transport.

XVIII. VENTRICULAR TACHYCARDIA WITH A PULSE-MICP

- A. Determine if the patient is stable or unstable. If the patient is hypotensive, dyspneic, complaining of chest pain or has altered mental status, he or she is considered unstable.
- B. **Stable Patient**

1. Consult medical control.
    - a) **Consider lidocaine, 1.0-1.5 mg/kg, IVP.** If VT persists, repeat lidocaine at half the initial dose (0.5-0.75 mg/kg) every 2-10 minutes until 3 mg/kg total has been administered. Use lower doses and longer intervals for patients 70 years of age or older, liver failure, heart failure, and/or smaller body size. Following the successful lidocaine bolus, administer a lidocaine infusion at 1-4 mg/min.
    - b) **Or; consider procainamide 20-30 mg/min** (unless underlying heart function is impaired) until; arrhythmia resolves, hypotensive, QRS widens 50 % of its original width, or max dose of 17 mg/kg is administered. Start maintenance infusion at 1-4 mg/min if successful.  
*(1) To give 20 mg/min. put 1 gm in 50 ml NS. Use a microdrip set and run at 60 gtts/min. To give 30 mg/min run at 90 gtts/min.*
    - c) **Or: consider amiodarone 150 mg IV infusion over 10 minutes** followed by an infusion of 1 mg/min for six hours then 0.5 mg/min over next 18 hours.
    - d) If polymorphic, **consider magnesium sulfate 1-2 g/100 ml D<sub>5</sub>W infused over 5- 60 min.** Follow this with 0.5-1.0 g/hour
  2. Transport.
- C. **Unstable patient**
1. Deliver **synchronized cardioversion at 100 joules; increase dose PRN to 200 joules then 300 joules; then 360 joules.** Do not delay cardioversion to start IV or sedate the patient.
    - a) If an IV is already in place and it will not cause a significant delay, the patient may be sedated as needed. Use **diazepam 2-5 mg slow IVP** titrated to relief of discomfort up to max of 10 mg **or use midazolam 1-2 mg slow IVP** titrated to relief of discomfort up to max of 5 mg.
  2. **Consider antiarrhythmic** after successful cardioversion.
  3. Transport.

## XIX. TRANSPORT

- A. Communications with on-line medical control or the receiving facility should be established at the earliest possible time without compromising the treatment efforts.
- B. If the patient has been stabilized before transport, do not use lights and sirens to transport. They will increase anxiety without any real benefit.
- C. Medevac-Anticipate potential problems and be prepared to treat them before they arise. For example, if the patient has been showing runs of VT that were successfully treated with O<sub>2</sub>, the cardioversion patches should be applied before the flight. Another example is to have the potential medications needed at hand, not in a bag buried under the cargo net.

## GASTROINTESTINAL BLEEDING

### I. GENERAL POINTS

- A. Gastrointestinal bleeding may be life threatening. It may also cause an aspiration risk. The cause is usually not relevant to the prehospital environment. The EMT should focus on managing shock as an effect of GI bleeding.

### II. ASSESSMENT

- A. Past medical history of gastrointestinal bleeding problems such as ulcers, diverticulitis, cancer, chronic alcohol consumption, esophageal varices, or history of previous surgery.
- B. Assess orthostatic vital signs.
- C. Signs and symptoms include:
  - 1. Weakness, dizziness, or fainting.
  - 2. Abdominal distention or tenderness.
  - 3. Bleeding from mouth or rectum.
  - 4. Vomiting blood or coffee ground-like vomitus or stool. Observe any vomit or stool; save specimen if possible.
  - 5. Dark, excessively smelly stool (melena).
  - 6. Jaundice.
  - 7. An enlarged spleen and an enlarged liver.
  - 8. Shock.

### III. MANAGEMENT

Every provider should follow the BLS section. EMT-2 providers should follow the BLS section and the EMT-2 section. EMT-3 providers should follow the BLS, EMT-2 and EMT-3 sections. MICPs should provide the care listed for all levels plus MICP.

#### **BLS**

- A. If the patient is not breathing adequately, **manage** the **airway** per the **Basic Airway Management** protocol.
- B. If patient is breathing adequately, **administer O<sub>2</sub>**, 10-15 lpm by nonrebreather mask. Use a nasal cannula at 1-6 lpm if the patient is agitated by the mask.
- C. **Position patient** to satisfy physiological needs. . Supine with legs elevated - if are hypotensive. In a sitting position - if not hypotensive. On side - if vomiting.
- D. **Treat shock.**

### **EMT-2**

- E. **Perform airway management** as indicated by the **Advanced Airway Management** protocol.
- F. Establish one or two IVs **of normal saline or ringer's lactate**. Draw bloods if time allows. Use a macrodrip administration set. If signs and or symptoms of shock are present, **run the IV solution wide open**, reassessing vital signs after every 250 ml. Watch for signs of circulatory overload. Run the IV at TKO if signs and symptoms of shock resolve.

### **EMT-3**

- G. **Monitor ECG** lead II.

### **MICP**

- H. Consider placement of a **nasogastric tube** if the transport time is prolonged. This may be contraindicated in upper GI bleed particularly if history of alcohol abuse.

# HYPERTENSION

## I. GENERAL POINTS

- A. Generally, a patient with a blood pressure on repeated exam of 160/90 or higher is considered hypertensive. Acute hypertension of itself is not an emergency. Problems that may result from hypertension are of concern. Emergency field treatment to reduce hypertension is seldom recommended. The medications available in the field setting are difficult to titrate and may cause a precipitous drop in blood pressure. Reducing the blood pressure may reduce the cerebral perfusion pressure and cause secondary brain injury. Therefore, in prehospital context, advanced life support treatment should be considered only if the blood pressure is >220 mmHg systolic or >120 mmHg diastolic.

## II. ASSESSMENT

- A. Signs and symptoms include; headache, dizziness, weakness, confusion, ringing in the ears, syncope, neurologic deficit or stroke, nausea, vomiting, chest pain, nose bleeding, bounding pulse, tachycardia, flushed skin.
- B. Determine past medical history. Previous history of hypertension or family history of hypertension. Also ask about risk factors; family history, race, obesity, stress, cigarette smoking, diet high in salt and saturated fats, age group.
- C. Use the appropriate size cuff for blood pressure measurement.

## III. MANAGEMENT

Every provider should follow the BLS section. EMT-2 providers should follow the BLS section and the EMT-2 section. EMT-3 providers should follow the BLS, EMT-2 and EMT-3 sections. MICPs should provide the care listed for all levels plus MICP.

### **BLS**

- A. If the patient is not breathing adequately, **manage** the **airway** per the **Basic Airway Management** protocol.
- B. If patient is breathing adequately, **administer O<sub>2</sub>**, 10-15 lpm by nonrebreather mask. Use a nasal cannula at 1-6 lpm if the patient is agitated by the mask.
- C. Position patient in **most comfortable position**. Elevate head 30° if the diastolic pressure is over 120 mm Hg or if there is evidence of neurologic deficit.

### **EMT-2**

- D. **Perform endotracheal intubation** as indicated by the **Advanced Airway Management** protocol.
- E. Place an **IV NS TKO**. Use a microdrip administration set. Draw bloods.

### **EMT-3**

- F. **Monitor ECG** lead II.

### **MICP**

- G. **Contact medical control** before administering any medication (aside from O<sub>2</sub>) to hypertensive patients.
- H. If evidence of new neurologic impairment is present or cardiac impairment and the blood pressure is significantly elevated, the medical control physician may order medications.
  - 1. **Anticipate** an order for **labetolol 10 mg IVP** over 1-2 minutes.
  - 2. Sublingual nifedipine (Procardia) is not indicated for acute treatment of hypertension.

#### IV. TRANSPORT

- A. Transport should be efficient, safe and quiet. Avoid use of lights and siren.
- B. Delayed transport
  - 1. Record vital signs over time. Many cases of hypertension will resolve over time as the patient calms or stress is relieved.

# HYPERVENTILATION

## I. GENERAL POINTS

- A. Hyperventilation, or an increase in respiratory rate greater than normal, usually represents the body's attempt to compensate for some disorder. Causes of hyperventilation include, pain, acidosis, head injury, fever, and shock. It is sometimes the result of anxiety. Anxiety induced hyperventilation syndrome can produce very uncomfortable effects yet is rarely harmful or life threatening.

## II. ASSESSMENT

- A. The presence of anxiety does not prove that hyperventilation syndrome is the cause. People suffering from acute myocardial infarction will typically be very anxious and may well have an increased respiratory rate. Hysterical behavior on the part of the patient may just as well be an indication of head injury or hypoxia from some other cause than from hyperventilation syndrome.
- B. The patient with hyperventilation syndrome usually complains of being short of breath. Likewise, many other serious causes of hyperventilation will also produce shortness of breath. Suspicion of hyperventilation syndrome should not deter a complete assessment to rule out other more serious reasons for increased respiratory rate.
- C. Common symptoms associated with hyperventilation syndrome include; lightheadedness, confusion, muscle cramps and carpopedal spasm, paresthesias, chest discomfort, and syncope
- D. A low pulse oximetry reading ( $< 95 \text{ SpO}_2$ ) may help identify hypoxia induced hyperventilation. Use caution even in the face of normal pulse oximetry readings, as they do not rule out compensatory hyperventilation from other causes.

## III. MANAGEMENT

- A. The commonly used **"brown bag" treatment is not acceptable** for this condition as it may result in hypoxia.
- B. If patient is breathing adequately, **administer  $\text{O}_2$** , 10-15 lpm by nonrebreather mask. Use a nasal cannula at 1-6 lpm if the patient is agitated by the mask.
  - 1.  **$\text{O}_2$  should not be withheld.** Giving  $\text{O}_2$  to a patient with hyperventilation syndrome will elevate the  $\text{O}_2$  level in the blood, but will not further depress the carbon dioxide level or worsen the respiratory alkalosis. Withholding  $\text{O}_2$  from someone who actually has hyperventilation associated with hypoxia can be very harmful.
- C. If the patient is not breathing adequately, **manage the airway** per the **Basic Airway Management** protocol.
- D. **Calm and reassure** the patient. Coached breathing may reduce the respiratory rate and reduce anxiety.
- E. Follow the **Respiratory Distress** protocol as needed.
- F. Check blood sugar and treat as indicated by the Diabetes protocol.



# NEONATAL RESUSCITATION

## I. GENERAL POINTS

- A. Simple measures such as airway positioning, suctioning, drying, warming and tactile stimulation are all that is usually required. ALS is seldom needed. Neonatal problems usually result from asphyxia, and usually respond to ventilation with 100% O<sub>2</sub>.
- B. Management of the newborn should focus on the basics:
  - 1. Airway management
  - 2. Effective ventilation
  - 3. Circulation
  - 4. Maintenance of body temperature

## II. ASSESSMENT

- A. History - a rapid history to identify newborns at risk for complications should include:
  - 1. Is labor premature? (estimated due date)
  - 2. Are twins expected?
  - 3. Is thick meconium present? (this may change management)
  - 4. Is there recent drug exposure? (cocaine, narcotics, etc.)
- B. Physical Exam. Assess the following:
  - 1. Respiratory effort
  - 2. Heart rate
  - 3. Muscle tone
  - 4. Color.

## III. MANAGEMENT

Every provider should follow the BLS section. EMT-2 providers should follow the BLS section and the EMT-2 section. EMT-3 providers should follow the BLS, EMT-2 and EMT-3 sections. MICPs should provide the care listed for all levels plus MICP.

### **BLS**

- A. Position the baby with head slightly down, **suction mouth then nose, dry and warm the baby**. If thick meconium was noted at delivery, suction mouth and airway prior to stimulation. Repeated suctioning may be necessary.
- B. **Reassess**
- C. **If centrally cyanotic, administer 100% oxygen by mask.**
- D. **Reassess.**
- E. **If gasping, apnea, persistent central cyanosis or pulse < 100, assist ventilation with a BVM and 100% O<sub>2</sub> at a rate of 40/minute.**

1. When ventilating a newborn, remember the volume of air for each breath should be just enough for the chest to begin to rise. The first few breaths may require more pressure, then the lungs are expanded and less pressure is needed.
- F. Assess **heart rate**. Palpate brachial pulse or the base of the umbilical cord. **If HR is <60** begin chest compressions, and rapidly transport. Notify the receiving facility.
- G. If HR > 100, and baby is pink or blue in hands and feet, keep warm and transport.

**EMT-2**

- H. If prolonged ventilation is required, intubate the patient with an appropriate-sized ET Tube.

**EMT-3**

- I. If heart rate remains below 60 after chest compressions, administer 0.1 ml/kg epinephrine 1:10,000 IVP. Repeat every 3-5 minutes as needed.

**MICP**

- J. Consider placement of an umbilical catheter if medications or fluids are immediately indicated.
- K. If thick meconium was noted at delivery, and infant is depressed, intubate and suction trachea, mouth and airway using endotracheal tube with meconium aspirator prior to stimulation. Repeated suctioning may be necessary to clear trachea.

## OBSTETRIC/GYNECOLOGIC

### I. GENERAL POINTS

- A. Remember that childbirth is a natural process and generally takes care of itself. When it does not, remain calm and contact medical control for assistance. Most EMT treatment for obstetrical problems is supportive. Little can be done except to address life threats such as airway, breathing and circulation problems and treat for shock.
- B. There are two lives at stake with the pregnant patient. Early recognition and treatment of complications increases the odds of survival for both.
- C. If the patient is experiencing vaginal bleeding refer to that protocol.

### II. ASSESSMENT

- A. Ectopic pregnancy. Any female of childbearing age that complains of abdominal pain should be considered to have an ectopic pregnancy. Tearing or rupture of the fallopian tube or other structures will happen as the fetus grows. This causes serious bleeding into the abdominal cavity.
  - 1. Signs and symptoms include;
    - a) Missed menstrual periods.
    - b) Positive pregnancy test.
    - c) Acute unilateral lower abdominal pain.
    - d) Radiated pain to the shoulder.
    - e) Hypotension.
    - f) Possible vaginal bleeding.
    - g) Guarding.
    - h) Shock.
- B. Labor and imminent delivery:
  - 1. Signs and symptoms of imminent delivery are;
    - a) Heavy bloody show.
    - b) Urge to push.
    - c) Feeling of need to defecate.
    - d) Crowning.
    - e) Frequent long duration (>1 min) contractions (every 1-2 minutes).
- C. Abnormal birth presentations:
  - 1. Normal delivery is head first or vertex.
  - 2. The most common abnormal presentation is breech. There are two types of breech deliveries.
    - a) Footling breech is when the foot or feet presents. This is a serious emergency.
    - b) Frank breech is when the buttocks present first. Delivery will be very difficult.

3. Other abnormal presentations include transverse lie, when the fetus presents sideways. Face first is another abnormal presentation. Delivery will be difficult with these presentations
  4. Any abnormal presentation puts the fetus at increased risk of trauma and hypoxia. There is also an increased risk of prolapsed umbilical cord.
- D. Prolapsed umbilical cord:
1. This condition is when the umbilical cord precedes the fetus. This causes compression on the cord and compromise of fetal circulation. The cord may be seen protruding from the vagina.
  2. Prolapsed cord is more common in abnormal presentations, premature labor, and when the membranes have previously ruptured.
- E. Uterine rupture and inversion:
1. Uterine rupture can occur when labor is prolonged or obstructed. Abdominal trauma can cause uterine rupture. It can also happen when there is a previous history of cesarean section.
    - a) If the uterus ruptures, the fetus will probably die and the mother is critical.
    - b) This patient will present with severe abdominal pain, non-progressive labor, and shock.
  2. Uterine inversion is when the uterus turns inside out. This may occur after delivery. It is often caused by pulling on the umbilical cord. It is a serious emergency because the connective tissue and blood vessels to the uterus have torn, causing severe hemorrhage. This patient will be in shock.
    - a) Uterine inversion can also occur in the elderly patient. This is not related to delivery.
- F. Post partum hemorrhage:
1. Some post partum bleeding is normal, and it is usually self-limiting. The normal amount is up to 500 ml of blood. Bleeding that is greater than that is considered a hemorrhage.
  2. Signs of post partum hemorrhage are:
    - a) Steady flow of bright red blood.
    - b) Abnormal volume of bleeding.
    - c) Developing shock.

### III. MANAGEMENT

Every provider should follow the BLS section. EMT-2 providers should follow the BLS section and the EMT-2 section. EMT-3 providers should follow the BLS, EMT-2 and EMT-3 sections. MICPs should provide the care listed for all levels plus MICP.

#### **BLS**

- A. If the patient is not breathing adequately, **manage** the **airway** per the **Basic Airway Management** protocol.
- B. If patient is breathing adequately, **administer O<sub>2</sub>**, 10-15 lpm by nonrebreather mask. Use a nasal cannula at 1-6 lpm if the patient is agitated by the mask.
- C. **Position patient** in most comfortable position that satisfies her physiological needs. Sitting upright - if she is having trouble breathing. Supine with legs elevated - if she is hypotensive. If the patient is >6 months pregnant, place patient in the left lateral recumbent position.
- D. Conduct **focused history and physical examination**.
  - 1. Determine last menstrual period. Assess for bleeding or discharge. Question for urinary symptoms, (frequency, pain, changes in color or odor).
  - 2. If patient is known to be pregnant, determine; due date, gravidity and parity, if membranes ruptured, drug use, possibility of multiple births, meconium staining, bleeding or spotting
  - 3. Palpate abdomen. Assess for guarding, distension, masses, and tenderness.
- E. If suspected **ectopic pregnancy** follow **Vaginal Bleeding** protocol. Watch and treat for shock.
- F. **If delivery is imminent:**
  - 1. Prepare the area.
    - a) Move patient inside shelter or into ambulance.
    - b) If en route, stop the ambulance.
    - c) Prepare the equipment; OB kit, towels, O<sub>2</sub>, suction, Broselow bag.
    - d) Advise dispatch of imminent delivery/delay on scene.
    - e) Don gloves, gown, goggles, and mask.
  - 2. Deliver the baby.
    - a) Coach the mother to bear down with contractions.
    - b) Control the delivery of the head with gentle pressure to prevent explosive delivery and injury to the mother.
    - c) Remove the membranes, if they are intact.
    - d) Check for the cord around the neck and gently slip it over the head if possible. If it is too tight, clamp and cut it. If this is done, the baby must be delivered quickly as the baby can asphyxiate.
    - e) Suction the baby's airway; mouth first, then nose.
    - f) Deliver the shoulders; anterior then posterior.
    - g) The rest of the body will deliver rapidly after the shoulders.

- h) Support the child at the level of the vagina.
  - i) Suction the airway again.
  - j) Be careful not to drop the baby, they are very slippery.
  - k) Clamp the cord 8 and 10 inches from the baby and cut it between the clamps. Ties may be used if clamps are unavailable.
- G. **Perform neonatal resuscitation.**
- 1. Drying, warming, positioning, suctioning, tactile stimulation.
  - 2. Follow the **Neonatal Resuscitation** protocol.
- H. Do not wait on scene to deliver the placenta. If the patient is expecting twins, transport between deliveries if possible.
- I. **Control postpartum bleeding** by massage of the uterine fundus. Nursing can also help control postpartum bleeding.
- J. If there is an **abnormal presentation**, contact medical control. The following procedure may be performed if indicated:
- 1. Breech; Deliver the body. **DO NOT PULL ON THE BABY.** If head will not deliver, insert gloved hand into vagina, form “V” with fingers to create an airway around the mouth and nose. Transport immediately maintaining airway en route.
  - 2. Transport immediately for all other abnormal presentations unless otherwise directed by on-line medical control.
- K. For **prolapsed umbilical cord**:
- 1. Insert gloved fingers into vagina and relieve pressure on cord.
  - 2. Do not attempt to push cord back into place.
  - 3. Transport immediately.

### **EMT-2**

- L. Establish one or two IVs of **normal saline**. Draw bloods if time allows. Use a macrodrip administration set. If signs and or symptoms of shock are present, **run the IV solution wide open, reassessing vital signs after every 250 ml.** Watch for signs of circulatory overload. Run the IV at TKO if S&S of shock resolve.

### **EMT-3**

- M. **Monitor ECG** lead II. Refer to the appropriate protocol if a dysrhythmia is seen.

### **MICP**

- N. **If the patient is seizing in third trimester and does not have a history of seizures, administer 2 gm magnesium sulfate IVP.** Repeat 2 gm PRN after 5 minutes. If unsuccessful, administer diazepam 5-10 mg intravenous push to control seizures.
- O. **To control post-partum hemorrhage** after placental delivery- **consider oxytocin, 10 units in one liter of normal saline run wide open.** Ensure external uterine massage has been attempted prior to using oxytocin.

## OBSTRUCTED AIRWAY

### I. GENERAL POINTS

- A. Obstruction of the airway can be complete with no air exchange, partial, still allowing for good air exchange, or nearly complete, resulting in poor air exchange.
- B. The patient with poor air exchange must be treated before hypoxia leads to unconsciousness and death. Treatment consists primarily of abdominal thrusts (the Heimlich maneuver), finger sweeps, direct viewing and foreign body removal using a laryngoscope.
- C. Upper airway obstruction may be caused by swelling. Airway obstruction from swelling is difficult to manage-the most important thing is to keep the patient calm. Refer to the **Anaphylaxis** protocol if swelling is suspected.

### II. ASSESSMENT

- A. General signs include: dyspnea, tachypnea, tachycardia, bradycardia (late sign in adults), altered mental status, pallor, cyanosis, diaphoresis, intercostal muscle retraction or accessory muscle use, prolonged capillary refill, abnormal sounds.
  - 1. Partial obstruction with preservation of good air exchange.
    - a) Conscious
    - b) Coughing or otherwise attempting to clear obstruction.
    - c) Grasping throat “universal sign.”
    - d) Usually able to indicate the nature of the problem to rescuers.
    - e) Good air movement can be detected on auscultation, although stridor may be present.
  - 2. High-grade obstruction with poor or no air exchange.
    - a) Unable to cough.
    - b) Poor air movement on auscultation.
    - c) Already unconscious or soon will be and will not be able to indicate nature of problem to rescuers:
- B. History: be alert for situations which may result in airway obstruction whenever presented with a victim who has suddenly become apneic, unconscious and cyanotic for no apparent reason. Examples are children playing with small objects or adults eating.
- C. Strongly consider foreign body obstruction in an apneic patient who is difficult to ventilate.

### III. MANAGEMENT-ADEQUATE AIR EXCHANGE

- A. **Do not interfere** with the patient's attempts to relieve the obstruction, including coughing and breathing. Do not attempt to reposition the patient or place supine.
- B. If patient is a child leave in caregiver's arms. Do not attempt to view airway or perform any procedure that will agitate child.
- C. **Apply 100% O<sub>2</sub>** via non-rebreather mask as tolerated.

D. Transport. Allow patient to travel in position preferred.

#### IV. MANAGEMENT-POOR AIR EXCHANGE

Every provider should follow the BLS section. EMT-2 providers should follow the BLS section and the EMT-2 section. EMT-3 providers should follow the BLS, EMT-2 and EMT-3 sections. MICPs should provide the care listed for all levels plus MICP.

### **BLS**

- A. **Suction** the patient to remove any obstructing secretions or fluids.
- B. If **foreign body** is suspected,
  - 1. **Perform abdominal thrusts.**
    - a) May be done with patient standing, sitting or supine.
    - b) Use chest thrusts if the victim is very obese or in the late stages or pregnancy.
  - 2. If unconscious, perform **head tilt-chin lift**.
  - 3. Open the patient's mouth and **perform finger sweep**. Do not perform blind sweeps in children.
  - 4. **Attempt ventilation** by bag-valve-mask.
  - 5. Transport.
  - 6. **Repeat** steps 1-5 until adequate ventilation is established.
- C. **Assist ventilation** with bag-valve-mask attached to 100% O<sub>2</sub>.
  - 1. Children with upper airway obstruction from swelling can often be ventilated adequately, even if they were not breathing adequately spontaneously.

### **EMT-2&3**

- D. Use laryngoscope and Magill forceps to **view and remove** foreign body obstruction. If laryngoscope is not available, repeat sequence of finger sweep, ventilation and abdominal thrusts.
- E. **Consider endotracheal intubation.**
  - 1. If the cause is swelling, this procedure will be very difficult and should be performed by the most experienced team member. Use ET tube smaller than usual.
  - 2. **If patient is totally obstructed after intubation, advance tube deeply** in an attempt to push foreign body into right mainstem bronchus.
- F. Transport

### **MICP**

- G. **If unable to intubate and ventilate** adequately;
  - 1. In adults, perform **surgical cricothyrotomy** and insert ET tube or tracheostomy tube in to trachea.
  - 2. **Needle cricothyrotomy** should be used **for children**.
  - 3. **Ventilate** through surgical airway.

H. Transport

V. CAUTIONS

- A. Abdominal thrusts are not a benign treatment. Do not use if patient has good air exchange. Complications can occur even when it is performed properly, including splenic rupture, liver lacerations, or rib fractures.
- B. Never attempt a finger sweep in a conscious patient, or in a patient with seizures even if unconscious.



## POISONING/OVERDOSE

### I. GENERAL POINTS

- A. Toxins may be ingested, inhaled, injected, or absorbed through the skin, accidentally or intentionally. If the patient is exposed to an environmental toxin, you may be too if you enter that area. Absorbed toxins must be flushed or brushed from skin as quickly as possible at the scene.
- B. Poisons and asphyxiants such as carbon monoxide and chlorine pose a significant threat to the unwary rescuer.
- C. The patient may have used the poison as an attempt to get “high” or may have attempted suicide. A good scene size-up will point you in the right direction.

### II. ASSESSMENT

- A. The signs and symptoms will vary according to the type of poison, dose, and type of exposure. Some patients may be alert, others unconscious, others sedate, and some violent. The suicidal patient is not competent to refuse care.
- B. Determine if this incident was intentional or accidental. Hospitalization and referrals are particularly important in suicide attempts. To better carry out his/her plan, the suicidal patient may lie. Clues from the scene will help validate the patient’s story.
- C. If suicide is suspected, ask:
  - 1. Do you intend to hurt yourself or others?
  - 2. Have you had thoughts of killing yourself?
  - 3. Do you have a plan for killing yourself?
  - 4. Do you feel like life isn’t worth living?
- D. If the answer is yes to any of the above questions, the patient should be encouraged to allow transportation to a medical facility for evaluation. If patient refuses, contact medical control. If medical control thinks the patient is a danger to self or others, law enforcement should be contacted. If unable to reach medical control, contact law enforcement.
- E. Determine substance, when exposed/ingested, amount, time, interventions, and estimated weight. If it is safe to do so, take a sample of the toxin to the hospital.

### III. MANAGEMENT

Every provider should follow the BLS section. EMT-2 providers should follow the BLS section and the EMT-2 section. EMT-3 providers should follow the BLS, EMT-2 and EMT-3 sections. MICPs should provide the care listed for all levels plus MICP.

### **BLS**

- A. Conduct **scene size-up**. Call for hazardous materials assistance if needed.
- B. If more than one patient presents with signs and symptoms of poisoning consider this event as a possible public health emergency and make appropriate notifications.
- C. If the patient is not breathing adequately, **manage** the **airway** per the **Basic Airway Management** protocol.
- D. If patient is breathing adequately, **administer O<sub>2</sub>**, 10-15 lpm by nonrebreather mask. Use a nasal cannula at 1-6 lpm if the patient is agitated by the mask.
- E. In the case of a serious poisoning, **early notification and safe, rapid transport** are priorities. The difficulties of identification and the many combinations of poisons and antidotes make out-of-hospital treatment of poisonings extremely difficult. Another factor is the difficulty of administering activated charcoal or inducing vomiting while en route. Medical control should be contacted before administering activated charcoal; patients with potential airway compromise should not be given charcoal due to the risk of aspiration.
- F. If patient's condition is not serious, the medic may contact Poison Control Center for further advice. The patient is not to be refused transportation without notifying medical control.
- G. **Contact** medical control and **Poison Control: 1 800-222-1222**.
- H. If unable to contact poison control and the patient ingested poison, and is responsive with a clear airway and the **transport time** to a medical facility is **greater than 15 minutes**, orally **administer Activated Charcoal 1 gm/kg**. Do not administer activated charcoal with sorbitol to a child due to the risk of dehydration due to diarrhea.

### **EMT-2**

- I. Perform endotracheal intubation as indicated by the **Advanced Airway Management** protocol.
- J. Establish one or two IVs **of normal saline**. Draw bloods if time allows. Use a macrodrip administration set. If signs and or symptoms of shock are present, **run the IV solution wide open, reassessing vital signs after every 250 ml**. Watch for signs of circulatory overload. Run the IV at TKO if S&S of shock resolve.
- K. **If narcotic overdose** is suspected and the patient is unconscious and experiencing respiratory depression and/or hypotension, **administer naloxone, 0.4 to 2 mg, slow IVP or IM if no IV access**. It is preferable that the patient not be awakened in the field. Only administer enough naloxone to reverse respiratory depression and or hypotension.

### **EMT-3**

- L. **Monitor ECG lead II**.
- M. **If it is known that the patient was exposed to an organophosphate poison, administer atropine 2-5 mg every 10-15 minutes** as needed to dry secretions.

### **MICP**

- N. **Consider** placing a large bore gastric tube and **evacuating gastric contents** if the ingestion was within 1-2 hours of patient presentation. This technique should only be used in life threatening overdoses that are otherwise difficult to treat.
- O. **If** the patient is known to have overdosed on a **tri-cyclic antidepressant**, and is experiencing hypotension and/or cardiac dysrhythmias, **administer 1-2 mEq/kg sodium bicarbonate**.
- P. **Consider** administration of **activated charcoal through a NG tube**.
- Q. **If cyanide poisoning, administer contents of cyanide antidote kit** following directions in kit.
- R. **If organophosphate poisoning, administer pralidoxime (2-PAM) 1-2 gm over 30 minutes**.
- S. **Consult medical control** for other specific treatment orders for poisoning.



## PULMONARY EDEMA

### I. GENERAL POINTS

- A. Pulmonary edema is caused by leakage of fluid into the alveoli of the lung, usually due to elevated left atrial pressures occurring because of left ventricular failure. Other causes of pulmonary edema include mitral valve disease, hypertension, and near drowning. Treatment consists of increasing cardiac contractility and/or lowering left atrial pressure by pharmacological means.
- B. Wet lung sounds do not automatically equal pulmonary edema. Other causes of rales or rhonchi include pneumonia, emphysema, and bronchitis. Treating these conditions as pulmonary edema could be harmful to the patient. Careful assessment is critical before initiating treatment.

### II. ASSESSMENT

- A. Pulmonary edema will usually present as shortness of breath with a patient who is reluctant to lie down and who wants to keep his or her legs dependent. Lungs will sound wet. The patient may have chest pain. The skin is usually pale and moist. Jugular venous distension is often visible. Peripheral edema is often present but not always. The liver may be engorged and seem large when palpated.
- B. When determining if the patient is suffering cardiogenic pulmonary edema vs. COPD or pneumonia, compare the assessment listed above with that of the others. Do not fall into the trap of treating based on just one sign. Non-cardiogenic pulmonary edema such as that caused by high altitude or near drowning is not treated the same as cardiogenic pulmonary edema.

### III. MANAGEMENT

Every provider should follow the BLS section. EMT-2s should follow the BLS section and the EMT-2 section. EMT-3s should follow the BLS, EMT-2 and EMT-3 sections. MICPs should provide the care listed for all levels plus MICP.

#### **BLS**

- A. **Position patient** with extremities dependent.
- B. If the patient is not breathing adequately, **manage** the **airway** per the **Basic Airway Management** protocol.
- C. If patient is breathing adequately, **administer O<sub>2</sub>**, 10-15 lpm by nonrebreather mask. Use a nasal cannula at 1-6 lpm if the patient is agitated by the mask.
- D. **Reassure patient**. Don't overlook the value of calming and reassuring patient.

#### **EMT-2**

- E. Establish an **IV of normal saline TKO**. Use a microdrip administration set. Draw bloods. Carefully monitor flow rate.

#### **EMT-3**

- F. **Monitor ECG** lead II.

- G. **Consider morphine sulfate, 2-5 mg, IVP** (if the patient is not hypotensive).

**MICP**

- H. **Administer nitroglycerin, 0.4 mg, SL.** Administer nitroglycerin every three to five minutes as long as systolic blood pressure is above 100 and symptoms continue. 1 inch of **nitroglycerin paste** may be used after the initial SL dose.
- I. If not given previously, **administer morphine sulfate, 2-5 mg, IVP** (if the patient is not hypotensive).
- J. **Administer furosemide, 20-80 mg, IVP** (if the patient is not hypotensive). If patient's oral lasix dose is known, double the dose, IVP.
- K. **Consider** placing a **foley catheter** if the transport time is longer than 30 minutes.
- L. Transport

IV. **TRANSPORT**

- A. There is a delicate balance between fluid overload and dehydration in the CHF patient. Careful monitoring and a willingness to change directions are critical in managing these patients long term.
- B. The near drowning patient with pulmonary edema will generally worsen in the first 24 hours post incident. Anticipate this worsening and be prepared to treat it with ventilatory support. Nitroglycerin, lasix and morphine are ineffective for treating this type of pulmonary edema.

# SEIZURES

## I. GENERAL POINTS

- A. Seizures are a symptom of an underlying problem including; epilepsy, head trauma, tumor, vascular disorders, metabolic abnormalities, hypoxia, hypoglycemia, overdoses or infections. Important things to consider when treating the seizure patient are maintaining the ABC's and treating reversible causes of seizures, i.e., hypoxia, and hypoglycemia.
- B. Be alert for vomiting or airway compromise, combativeness, or a lowered LOC during or after seizure.

## II. ASSESSMENT

- A. The patient may have history of previous seizures, medications, trauma, alcohol or drug abuse, withdrawal syndromes, diabetes, third trimester pregnancy, or surgery.
- B. Signs and symptoms:
  - 1. Seizure: Sudden loss of organized muscle tone; severely decreased level of consciousness; extensor muscle spasm; apnea; tonic-clonic movements. Some seizures are less obvious; the patient may appear confused and disinterested, have a glassy stare, blink and make lip-smacking movements. During this type of seizure, the patient may respond to verbal commands.
  - 2. Postictal state: drowsiness or confusion; muscle relaxation; deep breathing; depressed level of consciousness. May last for several hours after the seizure.

## III. MANAGEMENT

Every provider should follow the BLS section. EMT-2 providers should follow the BLS section and the EMT-2 section. EMT-3 providers should follow the BLS, EMT-2 and EMT-3 sections. MICPs should provide the care listed for all levels plus MICP.

### **BLS**

- A. Position the patient to prevent injury and to protect the airway. Put nothing in patient's mouth during seizure
- B. Protect the patient's privacy during and after the seizure. Remove any hazards from the area.
- C. **If the patient is actively seizing or is postictal:**
  - 1. Try to **prevent injuries** from the motion of seizure.
  - 2. Insert a **nasopharyngeal airway**.
  - 3. **Maintain the airway, suction** if necessary.
  - 4. **Loosen tight clothing**. Remove clothing if febrile
  - 5. **If patient is hypoxic** assist breathing with a **bag-valve-mask**, supplied with 15 liters of O<sub>2</sub> or a FROPVD.
  - 6. **If patient is breathing adequately, give O<sub>2</sub>**, 10-15 lpm by nonrebreather mask. Use a nasal cannula at 1-6 lpm if the patient is agitated by the mask.

7. Proceed to item E.
- D. **If the patient is not seizing and is not postictal:**
  1. **Administer** O<sub>2</sub> 10-15 lpm by nonrebreather mask if the patient is symptomatic.
  2. **Calm the patient** and provide continual reassurance.
- E. **Position patient** in most comfortable position. Sitting upright - if normotensive or having trouble breathing. On side-if actively seizing. Supine - if airway management is needed.
- F. Get an **accurate description** of the seizure type, duration, etc. Obtain a history from the patient, family, or other witness (part of body seizure started in, jerking of extremities, eyes deviated, mental status, urinary incontinence). Determine if there is a history of other significant medical conditions.
- G. Do **head-to-toe examination**. Examine head and neck; look for trauma, examine pupils, look in oropharynx for injuries. Assess for incontinence of bladder and/or bowel. Examine extremities and look for obvious motor deficits.

### **EMT-2**

- H. If patient is actively seizing or is postictal, start an **IV NS TKO**. For children, consult medical control and consider IO access if patient has status seizures and IV access cannot be obtained.
- I. **Rule out treatable causes:**
  1. Draw bloods and perform glucometry. **If the patient has a blood sugar (BG) reading < 80 mg/dl and has signs and symptoms consistent with hypoglycemia, administer D<sub>50</sub>W, 50 ml (25 grams), IVP.**
  2. **If narcotic overdose** is suspected and the patient is unconscious and experiencing respiratory depression and/or hypotension, **administer naloxone, 0.4 to 2 mg, slow IVP or IM if no IV access**. It is preferable that the patient not be awakened in the field. Only administer enough naloxone to reverse respiratory depression and or hypotension.

### **EMT-3**

- J. **Monitor ECG** lead II. If a dysrhythmia is seen, refer to the appropriate dysrhythmia protocol.

### **MICP**

- K. If the patient is **unable to maintain airway, consider** placement of an **endotracheal tube** (with rapid sequence intubation if the patient cannot be intubated otherwise).
- L. **Control Seizure:**
  1. **For adults:** If seizure lasts for more than 5 minutes (as described by credible witnesses), administer **diazepam 2-10 mg slow IVP** titrated to seizure cessation **or use midazolam 1-2 mg IM or slow IVP** titrated up to 5 mg to seizure cessation.

2. **For children:** If seizure lasts for more than 5 minutes (as described by credible witnesses), **administer diazepam 0.2-0.5 mg/kg IV, IO, or rectal**, titrated to cessation of seizures.
  3. **Consider fosphenytoin 10-20 PE/kg IV.** For adults, maximum administration rate 50 PE/min. For children, maximum administration rate 1-2 PE/kg/min.
- M. Follow dextrose administration with thiamine, 100 mg slow IVP if the patient is believed to be malnourished.

#### IV. SPECIAL CONSIDERATIONS

##### A. Delirium Tremens

1. Delirium tremens (DTs) occurs after a severe drop in the amount of alcohol consumed by an alcoholic. Delirium tremens is an acute medical emergency resulting in 10-15% mortality. Symptoms may begin from twelve to forty-eight hours after the last ingestion of alcohol.
2. Remember, even in alcoholics, there are many other causes of acute delirium to consider including hypoglycemia, hypoxia, sepsis and fever, drugs, trauma, and tumors. Always consider the treatable cause (hypoxia, hypoglycemia, and certain drugs).

##### B. Febrile Seizures

1. Febrile seizures are caused by a rapid elevation of the body temperature. They are isolated events occurring in children related to high temperatures.
2. Treat febrile seizures by managing the airway and cooling the patient.

##### C. Prolonged transport

1. The patient may have multiple seizure episodes before arrival at definitive care. Consult medical control about administration of anti-convulsants.



# STROKE

## I. GENERAL POINTS

- A. Stroke - also known as a Cerebral Vascular Accident (CVA) or Brain Attack is an interruption of the blood supply to the brain. The signs and symptoms are directly related to the region of the brain that is not receiving enough blood supply. Poor outcome from stroke can be minimized if recognized and treated early. The patient should be transported to a facility capable of rapid treatment. Some types of stroke treatment require that the time the symptoms start to treatment be no more than three hours. However, other stroke managements can be treated outside of the three-hour window.
- B. Stroke is not common in children but it does happen. Children with chronic illness like sickle cell anemia may suffer from stroke.
- C. EMS takes a four-part role in stroke care: rapid identification; support of vital functions; rapid transport to an appropriate facility; and pre-arrival notification of the receiving facility.

## II. ASSESSMENT

- A. Assess baseline vital signs and reassess frequently
- B. Cincinnati Prehospital Stroke Scale. The prehospital stroke scale was developed to rapidly identify the presence of stroke. It has been shown to be reliable and should be performed on all patients suspected of stroke. It evaluates three criteria; facial droop, arm drift, and speech. If the response to any of these criteria is abnormal, stroke is strongly suspected.
  - a) Facial droop-have patient show teeth or smile.
    - (1) *Normal - both sides of face move equally well.*
    - (2) *Abnormal - one side of face doesn't move as well as the other side.*
  - b) Arm drift-have patient close eyes and hold arms straight out.
    - (1) *Normal - both arms move the same or don't move at all.*
    - (2) *Abnormal - one arm either doesn't move or one arm drifts compared to the other.*
  - c) Speech-have the patient say "you can't teach an old dog new tricks."
    - (1) *Normal - patient uses correct words with no slurring.*
    - (2) *Abnormal - patient slurs words, uses inappropriate words, or is unable to speak.*
- C. Determine time of onset of symptoms. Time of signs and symptoms onset is important as it may differ from the time that the patient called for help. Record this as a time; not time elapsed (e.g. 17:45 rather than 30 minutes ago).

## III. MANAGEMENT

Every provider should follow the BLS section. EMT-2 providers should follow the BLS section and the EMT-2 section. EMT-3 providers should follow the BLS, EMT-2 and EMT-3 sections. MICPs should provide the care listed for all levels plus MICP.

### **BLS**

- A. **Immobilize the spine** according to the **Spinal Immobilization** protocol if trauma is suspected.
- B. If the patient is not breathing adequately, **manage** the **airway** per the **Basic Airway Management** protocol.
- C. If patient is breathing adequately, give **supplemental O<sub>2</sub>** as needed to maintain SpO<sub>2</sub> greater than 95%. If SpO<sub>2</sub> monitoring is not available, administer O<sub>2</sub>, 10-15 lpm by nonrebreather mask. Use a nasal cannula at 1-6 lpm if the patient is agitated by the mask.
- D. **Position with head elevated 30°.**

### **EMT-2**

- E. **Perform endotracheal intubation as indicated** in the **Advanced Airway Management** protocol.
- F. **While en route** to hospital, establish an **IV NS TKO**. Draw blood.
- G. **Check blood glucose.**

### **EMT-3 & MICP**

- H. **While en route, monitor ECG lead II.**
- I. Provide supportive care according to the appropriate protocol.

## IV. TRANSPORT

- A. If stroke is suspected, field time should be abbreviated like in trauma. **LOAD AND GO!**
- B. No definitive treatment for stroke can be initiated in the field.
- C. Securing the airway and packaging the patient are the only interventions that should be performed on scene.
- D. Give pre-arrival notification to the receiving facility. This early notification allows the hospital to prepare for patient arrival and will reduce delays in care. Relay the patient age, condition, and time of onset.

## V. SPECIAL CONSIDERATIONS

- A. Delayed Transport
  - 1. Protect paralyzed extremities from injury.
- B. Medevac
  - 2. Give O<sub>2</sub> to maintain SaO<sub>2</sub> greater than 95% or patient's baseline.
  - 3. Load patient head forward in the aircraft to minimize intracranial pressure changes.

## VAGINAL BLEEDING

### I. GENERAL POINTS

- A. Patients with vaginal bleeding can vary a great deal in presentation. They can present with light bleeding or spotting or life-threatening, severe vaginal bleeding.
- B. Differentiation between chronic or slow bleeding and exsanguinating hemorrhage is important, as treatment will depend on the life threat.

### II. ASSESSMENT

- A. Obtain accurate history of when bleeding started and how much blood loss has occurred, how many sanitary pads or tampons have been used and if blood loss is more or less than during a normal menstrual flow.
- B. Ask when last menstrual period was, possibility of pregnancy, any history of trauma, medications.
- C. Note any weakness, dizziness, fainting.
- D. Perineal examination should be deferred if the bleeding is minor and there is no history of trauma.

### III. MANAGEMENT

Every provider should follow the BLS section. EMT-2 providers should follow the BLS section and the EMT-2 section. EMT-3 providers should follow the BLS, EMT-2 and EMT-3 sections. MICPs should provide the care listed for all levels plus MICP.

#### **BLS**

- A. If the patient is not breathing adequately, **manage** the **airway** per the **Basic Airway Management** protocol.
- B. If patient is breathing adequately, and is **symptomatic** of shock, administer high flow O<sub>2</sub>, **10-15 liters by nonrebreather** if patient can tolerate mask.
- C. If patient is breathing adequately, is **asymptomatic**, and SpO<sub>2</sub> >95% administer O<sub>2</sub>, **at 2-6 liters by nasal cannula**.
- D. **Control external bleeding** from trauma such as lacerations **with direct pressure**.
- E. **Place patient in position** that satisfies her physiological needs. Supine with legs elevated - if hypotensive. In a sitting position - if not hypotensive.
- F. Conduct **focused history and physical examination**.
  - 1. Determine last menstrual period. Assess for bleeding or discharge. Question for urinary symptoms, (frequency, pain, changes in color or odor).
  - 2. If patient is known to be pregnant, determine; due date, gravidity (number of pregnancies) and parity (number of live births), if membranes ruptured, drug use, possibility of multiple births, meconium staining, bleeding or spotting
  - 3. Palpate abdomen. Assess for guarding, distension, masses, and tenderness.
- G. Package any clots or tissues passed with bleeding in biohazard bag and transport to hospital with patient.

- H. **Transport** to hospital promptly.

**EMT-2**

- I. Establish one or two IVs **of normal saline or ringer's lactate**. Draw bloods if time allows. Use a macrodrip administration set. If signs and or symptoms of shock are present, **run the IV solution wide open**, reassessing vital signs after every 250 ml. Watch for signs of circulatory overload. Run the IV at TKO if signs and symptoms of shock resolve.

**EMT-3 and MICP**

- J. **Monitor ECG** lead II. Refer to the appropriate protocol if a dysrhythmia is seen.

# TRAUMA



# MAJOR TRAUMA

## I. GENERAL POINTS

- A. Although careful stabilization of field conditions is a generally accepted goal for EMS practice, there are certain traumatic conditions that can only be effectively dealt with by surgical evaluation and treatment. **Trauma patients cannot be treated completely in the field.** They need to go to a medical facility. Trauma patients should be transported as soon as safely possible. Any delay in the field, clinic or emergency room can be harmful to the patient. Determine how the patient will be transported as soon as possible so that activation of a medevac or other transport can be performed in a timely manner.
- B. As with any emergency, the trauma scene must be assessed upon arrival for the presence of danger, including fire, hazardous materials, falling debris, highway traffic, etc. First priority should be given to the safety of the rescuer and then to altering the scene to make it a safe working environment, or if necessary, to moving the patient from the scene.
- C. The presence of alcohol or other drugs may mask some of the signs of severe trauma. Assume that the patient's condition is caused by trauma until proved otherwise.
- D. Treatments and procedures which are not specifically listed in this protocol may and should be omitted in the treatment of a major trauma patient, unless that treatment will not delay transport. For example, splinting and stabilization of extremity injuries should be omitted in order to expedite transport, although splinting may be done during extrication or en route to the hospital as long as doing so does not delay the transport or other indicated procedures.
- E. The same applies to detailed assessment, which should only be accomplished on the scene if transport is delayed by such factors as extrication, but which should otherwise be done en route if at all.

## II. ASSESSMENT:

- A. Patients with the following indicators should be treated as major trauma:
  - 1. Abnormal vitals:
    - a) GCS<14
    - b) RR >29 or <10
    - c) Systolic BP <90
  - 2. Anatomy:
    - a) Flail chest.
    - b) 2 or more long bone fractures.
    - c) Amputation proximal to ankle or wrist.
    - d) Penetrating trauma to head, neck, torso, and extremities, proximal to knee or elbow.
    - e) Limb paralysis.
    - f) Pelvic fracture.

- g) Trauma with burns.
- 3. Mechanism:
  - a) Ejection from automobile.
  - b) Death in same passenger compartment.
  - c) Rollover.
  - d) High speed automobile crash.
    - (1)  $> 40 \text{ mph}$
    - (2) *major auto deformity*  $> 20''$
    - (3) *intrusion*  $> 12''$
  - e) Extrication  $> 20 \text{ min.}$
  - f) Pedestrian thrown or run over.
  - g) Auto pedestrian  $> 5 \text{ mph.}$
  - h) Motorcycle crash  $> 20 \text{ mph}$  or separation of rider and bike.
  - i) Fall  $> 20'$ .
- 4. Co morbidities
  - a)  $<5$  or  $>55$  years.
  - b) Pregnancy.
  - c) Immunosuppressed.
  - d) Cardiac or Respiratory disease.
  - e) Insulin dependent diabetes, cirrhosis, morbid obesity, coagulopathy.
- 5. Any case in which the EMT judges the injuries to constitute major trauma (rationale for this decision should be clearly documented on the run sheet).

### III. MANAGEMENT

Every provider should follow the BLS section. EMT-2 providers should follow the BLS section and the EMT-2 section. EMT-3 providers should follow the BLS, EMT-2 and EMT-3 sections. MICPs should provide the care listed for all levels plus MICP.

- A. In any major trauma case, the **emphasis should be on rapid transport** to the nearest appropriate facility, even when this means limiting the application of otherwise appropriate field stabilization measures. Scene time in communities with emergency care facilities should not exceed 10 minutes unless delayed by extrication.
- B. In isolated communities with no emergency care facilities, scene time may be longer than 10 minutes but the patient should be moved indoors as soon as possible while awaiting medevac. In these situations, request for a medevac should be an immediate priority from the scene.
- C. In trauma cardiopulmonary arrest, consider terminating or withholding resuscitation according to the **Death in the Field** protocol.

## **BLS**

- D. **Stabilize patient's spine** in a neutral, in-line position as indicated in the **Spinal Immobilization** protocol.
- E. **Calm the patient** and provide continual reassurance.
- F. If the patient is not breathing adequately, **manage** the **airway** per the **Basic Airway Management** protocol.
- G. If the **patient is breathing adequately** but has experienced serious trauma, administer **high flow O<sub>2</sub>, 10-15 liters** (85-100 percent) **by nonrebreather**. If the patient has experienced minor to moderate trauma, O<sub>2</sub> should be provided at levels dictated by the **Pulse Oximetry** Protocol.
- H. Perform **basic management of chest wounds**:
  - 1. If open chest wound is present, dress with an occlusive dressing such as petroleum gauze secured on three sides, leaving one edge of dressing open. Caution: watch for development of tension pneumothorax.
  - 2. If flail chest is present with respiratory insufficiency, assist the patient's breathing with a bag-valve-mask device.
- I. **Control hemorrhage**.
- J. **Stabilize impaled objects** and do not remove unless the object is obstructing the airway or patient cannot be safely transported with the object in place.
- K. **Keep victim warm**.
- L. Apply **C-collar and backboard** where indicated. Extrications should be abbreviated with manual stabilization of the head and neck, but in some cases the use of a short board or KED may expedite transfer.
- M. **Position patient in most comfortable position**. Head elevated-if having trouble breathing. Supine with legs elevated 10-12 inches if in shock.
- N. **Transport**
- O. Follow appropriate protocol for specific injuries.

## **EMT-2**

- P. Perform **endotracheal intubation as indicated** by the **Advanced Airway Management** protocol.
- Q. **Transport**
- R. Establish **one or two IVs of normal saline or ringer's lactate**.
  - 1. Draw bloods if time allows.
  - 2. Use a macrodrip administration set.
  - 3. Largest catheter possible.
- S. If signs and or symptoms of shock are present, **run the IV solution wide open, reassessing vital signs after every 250 ml**. Watch for signs of circulatory overload.
  - 1. Run the IV at TKO if signs and symptoms of shock resolve.

2. For **children less than eight**, place an intraosseous catheter (**IO**) if IV access cannot be quickly obtained and the patient has a depressed level of consciousness so that the procedure is not extremely painful. Use **20ml/kg fluid boluses** in place of wide-open fluids. Reassess after every bolus and repeat PRN
3. If the patient has **shock**, **IVs** should be **started en route** to the receiving facility. Do not delay transport for IV access/fluid replacement.
4. If the patient has an **uncontrollable hemorrhage** (e.g. internal bleeding), fluid resuscitate to and maintain a **systolic blood pressure of 90 mmHg**.
5. If **hemorrhage is controllable**, resuscitate to **normal vital signs**.

### **EMT-3**

- T. **While en route, Monitor ECG lead II.**

### **MICP**

- U. Provide **airway management** per the **Advanced Airway Management** protocol.
- V. If tension pneumothorax, perform **chest decompression as indicated** in the Chest Trauma Protocol.
- W. If transport is delayed consider placing a nasogastric tube (orogastric if contraindicated) and foley catheter.

## IV. TRANSPORT

- A. The determination of transport destination in cases of major trauma is a field decision that should be made as rapidly as possible and communicated to that destination with as much advance notice as possible.
- B. Trauma care should be preplanned to the extent possible. It may not be possible to contact the physician in the emergency department while you are caring for the severely traumatized patient. However, when communications have been established, you should provide information to the receiving facility as soon as practical so preparations can be made to provide appropriate care for the patient.
- C. Triage and transfer protocols should be established by EMS physicians within the community and the protocols should be understood by all prehospital emergency care providers. The goal of these protocols should be to identify major trauma as early as possible so that these patients can be rapidly and safely transferred to definitive care centers.

# ABDOMINAL TRAUMA

## I. GENERAL POINTS

- A. Prehospital care of abdominal injuries should focus on quick treatment of internal bleeding and wound care. Penetrating trauma injures the area of entry and may damage any tissue along the line of penetration. Blunt trauma may be widely transmitted and cause damage to any or all organs within the abdominal cavity.
- B. Blunt trauma to the abdominal cavity may also cause injury to organs outside the abdominal cavity. These include internal chest organs. Ongoing reevaluation of the abdomen requires you to recheck the chest also.
- C. As with all trauma patients, complete therapy for abdominal injuries must take place in the hospital. Delays at any level can be harmful to the patient.
- D. Evaluation of abdominal trauma is part of the detailed assessment, it should be performed only after the patient's ABCs have been evaluated and supported, and the patient is en route to a higher-level medical facility or awaiting transportation to that facility.
- E. Children may have severe internal injuries from seemingly minor trauma. Any child with bruising or marks on the abdomen should be treated aggressively and transported emergently. A classic example of this is a spleen injury from bicycle handlebars evidenced only by a red circle on the abdominal wall.

## II. ASSESSMENT

- A. The mechanism of injury should prompt the provider to be suspicious for abdominal injuries.
- B. Look front and back at the bare abdomen for open wounds, evisceration, abrasions or bruises.
- C. Assess for difficulty breathing, listen to lung sounds.
- D. Feel the abdomen for tenderness and rigidity.
- E. Obtain and record vital signs frequently.
- F. Frequent rechecks of tenderness, rigidity and size are important. Hypotension, increasing size, and rigidity are signs of intra-abdominal bleeding.
- G. Record all findings.

## III. MANAGEMENT

- A. **Follow Major Trauma protocol as indicated.**
- B. If the patient is not breathing adequately, **manage** the **airway** per the **Basic Airway Management** protocol.
- C. If patient is breathing adequately, **administer O<sub>2</sub>**, 10-15 lpm by nonrebreather mask. Use a nasal cannula at 1-6 lpm if the patient is agitated by the mask.
- D. **Control external bleeding** and cover any open wounds with sterile dressings
- E. **Cover protruding organs** with moist gauze. Do not attempt to replace protruding organs. Apply a vapor barrier to hold in moisture and heat.

- F. **Stabilize impaled objects** penetrating the abdominal wall. Do not remove unless transport is not practical with the object in place.

### **EMT-2**

- G. Establish **one or two IVs of normal saline or ringer's lactate**.
1. Draw bloods if time allows.
  2. Use a macrodrip administration set.
  3. Largest catheter possible.
- H. If signs and or symptoms of shock are present, **run the IV solution wide open, reassessing vital signs after every 250 ml**. Watch for signs of circulatory overload.
1. Run the IV at TKO if signs and symptoms of shock resolve.
  2. For **children less than eight**, place an intraosseous catheter (**IO**) if IV access cannot be quickly obtained and the patient has a depressed level of consciousness so that the procedure is not extremely painful. Use **20ml/kg fluid boluses** in place of wide-open fluids. Reassess after every bolus and repeat PRN

### **EMT-3**

- I. **Monitor ECG** lead II.

### **MICP**

- J. Consult medical control and consider placing a nasogastric tube and foley catheter.

## IV. TRANSPORT

- A. Continue ongoing evaluation and stabilization of abdominal injuries en route to a higher level medical facility.
- B. If not otherwise contraindicated, patients with abdominal wounds should be allowed to get in a comfortable position. This usually includes pulling the legs up towards the body and holding a pillow or other bulky object tightly to the abdomen.
- C. Be prepared for vomiting, have suction ready and be prepared to roll the patient.

## V. SPECIAL CONSIDERATIONS

- A. Delayed Transport
1. Keep the patient NPO.
  2. If transport time is much delayed (>4 hrs.) administer 40 ml + weight in kg /hour of IV fluid to adults in addition to fluid needed for resuscitation. Also, consider a dextrose solution-consult with medical control.
    - a) For children administer maintenance fluids according to Broselow tape.
- B. Medevac

1. Anticipate possibility of pneumothorax. If patient has a pneumothorax, it is may worsen at altitude or to progress to a tension pneumothorax.
2. As altitude increases, trapped gases in the abdomen will expand, creating discomfort and decreasing chest expansion and thereby increasing hypoxia and ventilations.
3. Trapped gases in PASG will expand; monitor closely if used.



## CHEST TRAUMA

### I. GENERAL POINTS

- A. Chest trauma can lead to severe internal injuries, which are often difficult to specifically diagnose. A history of chest trauma should lead you to suspect a serious injury and patients should be treated with that expectation.
- B. Three major chest injury syndromes can lead to rapid death. They must be recognized and treated rapidly. They include:
  - 1. Bleeding from rupture of a major vessel;
  - 2. Mechanical decrease of cardiac output (which may be caused by cardiac tamponade, cardiac contusion, pneumothorax or hemothorax);
  - 3. Respiratory distress (which may be caused by tension pneumothorax, flail chest, or an open chest wound).
- C. As with all trauma patients, complete therapy for chest injuries must take place in the hospital. Delays at any level can be harmful to the patient.
- D. If chest injury interferes with breathing, it becomes part of your initial assessment and management of the trauma patient. Otherwise, evaluation of chest trauma is part of the detailed assessment and should be performed only after the ABCs have been evaluated and supported.

### II. ASSESSMENT

- A. Look at the neck and bare chest wall for asymmetry of movement, distended neck veins, open wounds, and bruises. Inspect the entire chest wall, front and back, maintaining spinal immobilization and log rolling when indicated.
- B. Listen to the chest for the movement of air.
- C. Feel the chest for tenderness, rib and clavicle fractures and crepitus.
- D. Obtain and record vital signs frequently.
- E. Reexamine the chest frequently, observing for changes.
- F. Respiratory distress, despite an open airway, may suggest a tension pneumothorax, a flail chest, or an open chest wound.
  - 1. Signs of a tension pneumothorax include the presence of diminished or unilateral breath sounds, distended neck veins, subcutaneous emphysema and severe respiratory distress.
  - 2. Signs of a flail chest may include paradoxical movement of the chest wall.
  - 3. Signs of an open chest wound include breaks in the chest wall, associated subcutaneous emphysema, and to and fro movement of air from the chest wound.
- G. Hypotension suggests disruption of a major vessel, cardiac tamponade, pneumothorax, hemothorax or a cardiac contusion.
  - 1. Signs of disruption of a major vessel include hypotension without evidence of external bleeding, and an appropriate mechanism of injury (e.g. steering wheel injury).

2. Signs of cardiac tamponade include history of blunt or penetrating chest trauma, the presence of distended neck veins, narrow pulse pressure and muffled heart sounds.
  3. Signs of cardiac contusion include chest pain with a history of blunt chest trauma and cardiac arrhythmias.
- H. Pediatric Concerns
1. Children have flexible ribs and seldom have rib fractures. Be very suspicious for internal chest trauma based on mechanism of injury. Be alert for external signs of internal chest trauma such as abrasions or bruising.

### III. MANAGEMENT

Every provider should follow the BLS section. EMT-2 providers should follow the BLS section and the EMT-2 section. EMT-3 providers should follow the BLS, EMT-2 and EMT-3 sections. MICPs should provide the care listed for all levels plus MICP.

#### **BLS**

- A. **Follow Major Trauma protocol as indicated.**
- B. Avoid transporting patient on injured side as this may reduce ability of the lungs to exchange O<sub>2</sub>.
- C. If the patient is not breathing adequately, **manage** the **airway** per the **Basic Airway Management** protocol.
- D. If the **patient is breathing adequately** but has experienced serious trauma, administer **high flow O<sub>2</sub>, 10-15 liters** (85-100 percent) **by nonrebreather**. If the patient has experienced minor to moderate trauma, O<sub>2</sub> should be provided at levels dictated by the **Pulse Oximetry** Protocol.
- E. **Flail chest** (paradoxical respirations, respiratory distress)
  1. As needed, assist ventilation with positive pressure O<sub>2</sub>. **Positive pressure ventilation** (PPV) treats the major problems from flail chest; ventilatory compromise from chest wall instability is virtually eliminated by PPV.
  2. Little can be done to stabilize a flail section in the field. Bulky dressings, tape, and IV bags all compromise chest expansion and are seldom effective in reducing flail segment movement. Efforts should be focused on resuscitation and transport.
- F. **Open chest wounds** (breaks in the chest wall, associated subcutaneous emphysema, and to and fro movement of air from the chest wound.)
  1. Cover with an **occlusive dressing** taped on three sides.
  2. Observe closely for signs of developing tension pneumothorax.
- G. **Tension pneumothorax** (Jugular venous distension, respiratory distress, unilateral or decreased breath sounds.)
  1. If a penetrating chest wound has been sealed, temporarily **unseal the wound** and allow air to escape.
  2. Assist ventilation with positive pressure O<sub>2</sub> if necessary.

### **EMT-2**

- H. **Flail chest** (paradoxical respirations, respiratory distress)
1. **Place an endotracheal tube, dual lumen airway or laryngeal mask airway** per the **Advanced Airway Management** protocol **and assist ventilation** with positive pressure O<sub>2</sub>.
- I. Establish **one or two IVs of normal saline or ringer's lactate**.
1. Draw bloods if time allows.
  2. Use a macrodrip administration set.
  3. Largest catheter possible.
- J. If signs and or symptoms of shock are present, **run the IV solution wide open, reassessing vital signs after every 250 ml**. Watch for signs of circulatory overload.
1. Run the IV at TKO if signs and symptoms of shock resolve.
  2. For **children less than eight**, **place** an intraosseous catheter (**IO**) if IV access cannot be quickly obtained and the patient has a depressed level of consciousness so that the procedure is not extremely painful. Use **20ml/kg fluid boluses** in place of wide-open fluids. Reassess after every bolus and repeat PRN
  3. If the patient has **shock**, **IVs** should be **started en route** to the receiving facility. Do not delay transport for IV access/fluid replacement.
  4. If the patient has an **uncontrollable hemorrhage** (e.g. internal bleeding), fluid resuscitate to and maintain a **systolic blood pressure of 90 mmHg**.
  5. If **hemorrhage is controllable**, resuscitate to **normal vital signs**.

### **EMT-3**

- K. **Monitor ECG** lead II. If a dysrhythmia is seen, refer to the appropriate dysrhythmia protocol.

### **MICP**

- L. **Flail chest** (paradoxical respirations, respiratory distress)
1. Using Rapid Sequence intubation if needed, **place an endotracheal tube** per the **Advanced Airway Management** protocol **and assist ventilation** with positive pressure O<sub>2</sub>.
- M. **Tension pneumothorax** (Jugular venous distension, respiratory distress, unilateral or decreased breath sounds)
1. **Decompress chest** with large bore needle in midclavicular second intercostal space in affected side(s).
  2. Assist ventilation with positive pressure O<sub>2</sub> if necessary.
- N. Cardiac tamponade or contusion (distant heart sounds, JVD, dysrhythmias)
1. Consult medical control about pericardiocentesis.
  2. Treat symptoms, patient usually hypotensive.

- O. If the patient is experiencing **significant pain**, **contact medical control** and **consider** administering **morphine sulfate 2-5 mg** slow IVP titrated to pain relief. May repeat PRN up to max of 10 mg.

#### IV. SPECIAL CONSIDERATIONS

- A. Delayed Transport
  - 1. Internal bleeding may be present so continually monitor for changes in vital signs and treat accordingly.
- B. Medevac
  - 1. Consider using a medevac service capable of placing chest tubes.
  - 2. If patient has a pneumothorax, it is likely to worsen at altitude or to progress to a tension pneumothorax.
  - 3. As altitude increases, trapped gases in the abdomen will expand, creating discomfort and decreasing chest expansion and thereby increasing hypoxia and ventilations.
  - 4. Trapped gases in PASG will expand; monitor closely if used.
  - 5. Attempt to maintain cabin pressure as low as reasonable.

# DISLOCATIONS-DELAYED TRANSPORT

## I. GENERAL POINTS

- A. It is difficult or impossible to achieve pain-free immobilization during prolonged transport, especially during evacuation over rough terrain. Joints that are left in the dislocated position for prolonged time may suffer from impaired circulation, and may be more difficult to reduce later. In order to avoid prolonged pain and possibly, to avoid further injury to the joint and surrounding structures, it may be reasonable to attempt early reduction in the field of selected simple dislocations.
- B. For the purposes of these guidelines, **delayed transport** occurs when the time required to reach an emergency health care facility **is more than 2 hours**.
- C. This protocol is to be used only by those who have taken specialized training in these procedures e.g. a Wilderness EMT course and are authorized by medical control.
- D. The standard of care for ambulance context EMS recommends that joints with impaired distal circulation be repositioned by applying traction and moving the joint into a normal anatomical position. In the delayed transport context, it is recommended that all simple dislocations (indirect dislocation of the shoulder, patella and digits) be moved into anatomical position.
- E. Any manipulation of the joint is discontinued if pain is increased or if resistance is encountered. These are the same as conventional EMS clinical guidelines. In any treatment context, manipulation is discontinued and the injury is splinted "in place" if pain is increased or resistance is encountered. Dislocated joints splinted in place may reduce spontaneously.
- F. DEFINITIONS
  - 1. **Abduction** - The act of drawing or moving away from the midline.
  - 2. **Adduction** - The act of drawing or moving towards the midline.
  - 3. **Direct injury** - A dislocation caused by a force applied directly to the joint.
  - 4. **Indirect injury** - A dislocation caused by a lever or torque force applied at a distance from the joint.
  - 5. **Simple dislocation** - A dislocation of the shoulder, patella, or digits, caused by indirect injury.

## II. GENERAL TREATMENT

- A. Medical control should be consulted if possible.
- B. An attempt to reduce a simple dislocation into anatomical position should be made if transport time is delayed or prolonged greater than two hours, even if distal circulation is normal.
- C. If reduction is to be attempted, it should be done as soon as possible after injury. Muscle spasms usually increase over time, and reduction is more difficult the longer the joint remains dislocated.
- D. Check circulation and nerve function before and after any manipulation of an injured bone or joint.

- E. Reduction of simple dislocations is generally performed by applying gentle and steady traction and then moving the injured joint into normal anatomical position. Specific techniques are described under specific dislocations.
- F. Discontinue an attempt at reduction if pain is significantly increased by manipulation; or resistance to movement is encountered.
  - 1. In these cases, the joint should be immobilized as comfortably as possible in the position of injury for transport.
- G. If trained and authorized, before attempting to reduce a dislocation, consider **morphine sulfate 2-5 mg** slow IVP titrated to pain relief. May repeat PRN up to max of 10 mg. Also, administer **diazepam 2-5 mg** slow **IVP** titrated to relief of anxiety up to max of 10 mg **or** use **midazolam 1-2 mg** slow **IVP** titrated to relief of anxiety up to max of 5 mg. Watch respiratory drive carefully and be prepared to reverse agents and/or assist ventilations as needed.

### III. SHOULDER

#### A. General Points

- 1. Simple anterior dislocations generally occur when the arm is in the position of 90 degrees abduction and full external rotation (i.e., "throwing a baseball"). Posterior force (from a fall, moving water, etc.) at the lower arm or elbow causes a levering action which dislocates the head of the humerus anteriorly out of the shoulder joint.
- 2. Recurrent anterior dislocations are common.
- 3. Associated injury to axillary nerve and brachial plexus is common. Although it does not change treatment, this injury should be documented.
- 4. Fractures that occur with simple anterior dislocations are generally minor and do not change treatment procedures.

#### B. Assessment

- 1. Mechanism of injury is consistent with simple dislocation.
- 2. Patients commonly describe the injury accurately as a "dislocated shoulder."
- 3. Patient is unable to reach hand across to touch the uninjured shoulder.
- 4. Injured shoulder generally shows a typical "hollow spot" deformity that is not present on the uninjured side.
- 5. Check and document status of peripheral nerves before and after treatment. Check the brachial plexus by testing motor/sensory function in both hands. Check the axillary nerve function by testing sensory function over the deltoid muscle.

#### C. Treatment Overview

- 1. Check and document distal circulation, motor and sensory function.
- 2. If care will be delayed more than two hours, with the patient's informed consent, an attempt to reduce the dislocation may be made by traction and external rotation, or simple hanging traction.

## D. Specific Treatment

### 1. Traction and External Rotation

- a) Apply gentle and steady traction along the axis of the humerus. If done correctly, this should cause a significant reduction in pain.
- b) While maintaining gentle steady traction, guide the patient into a comfortable supine position.
- c) Guide the arm first into a position of about 90 degrees abduction, and then into a position of full external rotation (i.e., "throwing a baseball"). Maintain gentle and steady traction during this movement.
- d) Positioning of the arm should cause no significant increase in pain, and will generally reduce pain if done correctly. Movement must be gradual and slow as positioning often takes up to 15 minutes. Movement that is too fast or unsteady may result in muscle spasm and pain. Discontinuing the movement and holding the joint in position using light, gentle, and steady traction may relieve the pain of muscle spasm.
- e) When the position of 90 degrees abduction and full external rotation has been attained ("throwing a baseball"), hold the arm in that position and maintain light, gentle and steady traction to relieve muscle spasm.
- f) When the joint is in the correct position and muscle spasm is effectively relieved, the dislocation will generally reduce spontaneously within 15 minutes. Both the patient and the rescuer usually will feel joint reduction.
- g) If reduction does not occur, guide the arm into more abduction (up to 120 degrees = "high baseball" position). Continue gentle and steady traction and wait up to 15 minutes for spontaneous reduction.
- h) Note that strong traction and countertraction are not used in this method of reduction. Note also that there is no need to lever the joint into position by force or to apply pressure in the axilla with the rescuer's foot.
- i) After reduction (or to check for reduction), first adduct the arm by bringing the elbow to the patient's side, and then internally rotate the arm. Maintain light and steady traction during this movement.
- j) Recheck and document distal circulation and status of axillary and peripheral nerves.
- k) Immobilize using a sling and swathe.
- l) Immobilize as comfortably as possible in the position of injury and transport if the attempt at reduction is unsuccessful or:
  - (1) *pain is significantly increased by manipulation; or*
  - (2) *resistance to positioning is encountered.*

## 2. Simple Hanging Traction

- a) Apply gentle and steady traction along the axis of the humerus. If done correctly, this should cause a significant reduction in pain.
- b) While maintaining gentle and steady traction, guide the patient to a comfortable prone position with the injured arm hanging down freely over the edge of a supporting surface (table, flat rock, etc.).
- c) The axilla should be at the edge of the supporting surface and should be protected by padding.
- d) Stabilize the patient on the supporting surface to prevent falling.
- e) As the weight of the hanging arm relieves muscle spasm and pain, spontaneous reduction often occurs.
- f) Reduction generally occurs sooner if weight is added to the hanging arm. About 10-15 pounds is generally sufficient. Weight should be taped or strapped to patient's arm (having the patient hold the weight increases muscle tone and prevents reduction).
- g) Spontaneous reduction is clearly felt by the patient. Wait up to 60 minutes for reduction to occur by this method.
- h) After reduction, roll the patient into the supine position keeping the injured arm close to the trunk during movement.
- i) Recheck and document distal circulation and status of axillary and peripheral nerves.
- j) Immobilize using a sling and swathe.
- k) Immobilize as comfortably as possible in the position of injury and transport if the attempt at reduction is unsuccessful or:
  - (1) *pain is significantly increased by manipulation; or*
  - (2) *resistance to positioning is encountered.*

## IV. PATELLA

### A. General principles

1. Simple lateral dislocations occur when a knee that is partially flexed has lateral stress applied and the knee is then forcibly extended (e.g. walking down a steep slope, gymnastics, dancing, etc.). The patella and patellar tendon usually dislocate laterally, much like a cable slips off a pulley.
2. Recurrent dislocations are common.
3. Concurrent injury to adjacent nerves and vessels is rare.

### B. Assessment

1. Mechanism of injury is consistent with simple dislocation.
2. Patients commonly describe the injury accurately as a "dislocated kneecap."
3. History of recurrent dislocation is common.
4. Early exam (before swelling) clearly shows the patella dislocated laterally.

C. Treatment

1. Check and document distal circulation, motor and sensory function.
2. If care will be delayed more than two hours, attempt to reduce the dislocation after obtaining the patient's informed consent.
3. Loosen the patellar tendon by flexing the hip and straightening the knee.
4. After the hip is flexed and the knee straightened firmly push the patella medially back into normal position.
5. Recheck and document distal circulation and status of peripheral nerves.
6. Immobilize the leg in full extension.
7. Immobilize as comfortably as possible in the position of injury and transport if the attempt at reduction is unsuccessful or:
  - a) pain is significantly increased by manipulation; or
  - b) resistance to positioning is encountered.

V. DIGITS

A. General Principles

1. Simple dislocations occur when a force is applied to the shaft of the digit and the joint is "levered" apart (e.g. catching a ball on the fingertip). Dislocated digits can be angulated, or they can override with a "bayonet" deformity.
2. Concurrent injury to adjacent nerves and vessels is possible. Compression of adjacent vessels often causes impaired distal circulation.
3. Fractures often occur with dislocated digits, but they do not change the initial field treatment.

B. Assessment

1. Mechanism of injury is consistent with simple dislocation.
2. Patient is unable to move the injured joint.
3. Early exam (before swelling) shows the digit locked and angulated at a joint or with a typical "bayonet" deformity.

C. Treatment

1. Check and document distal circulation, motor and sensory function.
2. If definitive care will be delayed more than two hours, attempt to reduce the dislocation after obtaining the patient's informed consent.
3. Apply firm traction to the distal segment while applying distal pressure to the distal bone and restore it to normal anatomic position.
4. Recheck and document distal circulation and status of peripheral nerves.
5. Immobilize by splinting or by taping injured digit to the adjacent uninjured digit.
6. Immobilize as comfortably as possible in the position of injury and transport if the attempt at reduction is unsuccessful or:
  - a) pain is significantly increased by manipulation; or
  - b) resistance to positioning is encountered.



## EXTREMITY TRAUMA

### I. GENERAL POINTS

- A. In the severely injured patient, injuries to extremities take a relatively low priority of management. When treating trauma patients, your first priority must be to rapidly identify and treat life-threatening conditions in order of risk to the patient. Do not let a grotesque but relatively minor extremity injury sidetrack you.
- B. Almost all extremity hemorrhage can be controlled by direct pressure or pressure dressings. Very rarely will a tourniquet be required.
- C. In multiple trauma, or in the presence of life threatening injuries, splinting becomes a low priority and oftentimes may not be completed in the field. The backboard makes an effective total body splint in such cases. As with all trauma patients, complete therapy for extremity injuries takes place in the hospital. Delays at any level can be harmful to the patient.
- D. Evaluation of extremity trauma is part of the focused physical exam and should be performed only after the patient's ABCs have been evaluated and supported.
- E. It is oftentimes difficult in the field to tell the difference between a sprain, strain, dislocation and fracture. Do not concern yourself with differentiation, as the treatment for all of them is immobilization.

### II. ASSESSMENT

- A. Look for obvious deformities, abrasions, bruises, bleeding sites, amputated parts, and protruding bones.
- B. Feel for fractures, crepitus, and dislocations.
- C. Check sensation distal to deformities with light touch and a sharp sensation.
- D. Check circulation distal to deformities.
- E. Check movement distal to deformities.

### III. MANAGEMENT

Every provider should follow the BLS section. EMT-2 providers should follow the BLS section and the EMT-2 section. EMT-3 providers should follow the BLS, EMT-2 and EMT-3 sections. MICPs should provide the care listed for all levels plus MICP.

#### **BLS**

- A. **Follow Major Trauma protocol as indicated.**
- B. If the patient is not breathing adequately, **manage** the **airway** per the **Basic Airway Management** protocol.
- C. If the **patient is breathing adequately** but has experienced serious trauma, administer **high flow O<sub>2</sub>, 10-15 liters** (85-100 percent) **by nonrebreather**. If the patient has experienced minor to moderate trauma, O<sub>2</sub> should be provided at levels dictated by the **Pulse Oximetry** Protocol.
- D. **Control bleeding** and cover open wounds with a sterile dressing. Clean debris from exposed bone ends and irrigate with normal saline if possible.

- E. **Straighten** angulated **extremities**. Apply gentle traction and align the extremity to its normal anatomical position. Stop straightening if there is a significant increase in pain or resistance is felt.
- F. **Splint** the injury by immobilizing the fracture site as well as the joint above and below the fracture.
- G. **Immobilize injured joints** in the position found, unless motor function, sensation or circulation is impaired distal to the joint. In such cases, apply gentle traction and align the extremity in its normal anatomical position. Stop straightening if there is a significant increase in pain or resistance is felt.
- H. **Splinting** recommendations for **specific injuries**:
  - 1. Pelvic fracture
    - a) Wrap pelvis in sheet extending from umbilicus to mid thigh. Pull sheet ends in opposite directions, applying pressure to pelvis (this requires a lot of force; it would be difficult to over-tighten). Secure sheet with wire ties, or tighten and secure as in application of a tourniquet (a knot will not be tight enough).
  - 2. Shoulder Girdle
    - a) Sling and swath (you may need to pad between the patient's arm and chest for an anterior dislocation)
  - 3. Hip Dislocation
    - a) Immobilize to a backboard using padding to maintain the limb in a comfortable position.
  - 4. Hip Fracture
    - a) Place on padded backboard with pillow between legs. Secure legs to board and secure pelvis.
  - 5. Femur fractures
    - a) Traction splint if isolated to shaft of femur.
    - b) Use pediatric splint for children.
- I. PASG may be used as a splint in cases of multiple leg fractures.
- J. Amputated parts should be wrapped in sterile gauze moistened with normal saline, protected from contamination (e.g., placed in a sterile rubber glove or zip lock bag) and put in ice water. Do not allow the tissue to freeze. Amputated parts should be transported with the patient if possible. Label container with the patient's name, date and time.

### **EMT-2**

- K. Establish **one or two IVs of normal saline or ringer's lactate**.
  - 1. Draw bloods if time allows.
  - 2. Use a macrodrip administration set.
  - 3. Largest catheter possible.
- L. If signs and or symptoms of shock are present, **run the IV solution wide open, reassessing vital signs after every 250 ml**. Watch for signs of circulatory overload.

1. Run the IV at TKO if signs and symptoms of shock resolve.
2. For **children less than eight**, **place** an intraosseous catheter (**IO**) if IV access cannot be quickly obtained and the patient has a depressed level of consciousness so that the procedure is not extremely painful. Use **20ml/kg fluid boluses** in place of wide-open fluids. Reassess after every bolus and repeat PRN
3. If the patient has **shock**, **IVs** should be **started en route** to the receiving facility. Do not delay transport for IV access/fluid replacement.
4. If the patient has an **uncontrollable hemorrhage** (e.g. internal bleeding), fluid resuscitate to and maintain a **systolic blood pressure of 90 mmHg**.
5. If **hemorrhage is controllable**, resuscitate to **normal vital signs**.

### **EMT-3& MICP**

- M. If the patient is experiencing **significant pain**, **contact medical control** and **consider** administering **morphine sulfate 2-5 mg** slow IVP titrated to pain relief. May repeat PRN up to max of 10 mg.

#### IV. TRANSPORT

- A. Continue reassessing the patient and splinted extremities en route to the medical facility.
- B. If transport is delayed, adjust splints to accommodate for swelling so that distal circulation is not compromised.
- C. Notify the receiving facility as soon as possible.
- D. Avoid the use of air splints or PASG if the patient is to be transported by aircraft.
- E. Monitor vacuum splints and adjust vacuum at altitude.



# HEAD TRAUMA

## I. GENERAL POINTS

- A. A trauma patient with an obvious head injury or a history of head injury should have his or her spine immobilized until a spine injury has been ruled out.
- B. In the emergency management phase of acute head trauma, hypoxia and hypotension can be lethal to the patient and must be managed early and thoroughly.
- C. Patients with head injuries can get worse quickly, although they appear stable initially.
- D. Alcohol and drugs make the evaluation of head injuries very difficult. Always assume symptoms are the result of the trauma and treat as such.
- E. Evaluation of head and spine injuries is part of the detailed examination and should be done only after the patient's ABCs have been evaluated and supported, and he or she is en route to a higher-level medical facility or awaiting transportation to that facility.
- F. The head is proportionately larger and heavier in the small child. This leads to head injury when the head is propelled forward in an accident. It also necessitates the need for additional padding under the child's torso to maintain normal anatomical positioning. Children have large tongues in proportion to the mouth so watch for airway problems in the child who has a head injury.

## II. ASSESSMENT

- A. Hypotension in an adult, except as a terminal event, is not caused by isolated internal head injuries. If you have a head injured adult patient with hypotension, you should assess the chest, abdomen, pelvis and femurs for additional injuries.
- B. Inspect for lacerations, asymmetry, bleeding sites, bruising behind the ear/s, or clear fluid from ears or nose.
- C. Gently palpate for fractures, lacerations, or depressions.
- D. Evaluate and record mental status. The patient's level of consciousness is the best indicator of brain function. Obtain and record serial AVPU and Glasgow Coma Scale measurements.
- E. Evaluate pupil size and reactivity.
- F. Evaluate spinal cord integrity in conscious patient by recording ability to move extremities to command. Perform gross sensory exam with sharp sensation and light touch.
- G. Evaluate spinal cord integrity in an unconscious patient by recording presence or absence of extremity movement to painful stimulus.
- H. Frequent repetitive examinations on the way to the hospital are essential as a head-injured patient may deteriorate rapidly. Changes in the exam can be more important than the initial exam.
- I. Record each examination of the patient.
- J. Pediatric Considerations:

1. Smaller children should not be separated from their parents; if possible, examine them in their parent's arms.

### III. MANAGEMENT

Every provider should follow the BLS section. EMT-2 providers should follow the BLS section and the EMT-2 section. EMT-3 providers should follow the BLS, EMT-2 and EMT-3 sections. MICPs should provide the care listed for all levels plus MICP.

#### **BLS**

- A. **Follow Major Trauma protocol as indicated.**
- B. If indicated by the **Spinal Immobilization** protocol, **immobilize the spine** with a cervical collar and rigid fixation to a backboard.
- C. If the patient is not breathing adequately, **manage the airway** per the **Basic Airway Management** protocol and;
  1. Maintain normal respirations; adult **-10 - 12 bpm**, children under 8 years of age **12-16 bpm**, and infants **16-20 bpm**, unless;
    - a) The GCS score is 8 or less,
    - b) and active seizures or one or more of the following signs are present,
      - (1) *Fixed or asymmetric pupils*
      - (2) *Abnormal flexion or abnormal extension*
      - (3) *Hypertension and bradycardia in conjunction with altered mental status*
      - (4) *Intermittent apnea*
      - (5) *Further decrease in GCS score of 2 or more points*
    - c) If the above signs are seen, hyperventilate the adult patient at **16 - 20 bpm**, children under 8 years of age **20-24 bpm**, and infants **24-26 bpm**.  
**Do not hyperventilate unless the above criteria are met.**
- D. If the **patient is breathing adequately** but has experienced serious trauma, administer **high flow O<sub>2</sub>, 10-15 liters** (85-100 percent) **by nonrebreather**. If the patient has experienced minor to moderate trauma, O<sub>2</sub> should be provided at levels dictated by the **Pulse Oximetry** Protocol.
- E. **Treat bleeding** as indicated with pressure dressings, taking care not to put undue pressure on possible fracture sites.
- F. For mild head injuries or if the patient is on a backboard and is not hypotensive, elevate the head slightly
- G. If the patient is hypotensive, treat for shock, even if there are head injuries.

#### **EMT-2**

- H. Establish **one or two IVs of normal saline**.
  1. Draw bloods if time allows.
  2. Use a macrodrip administration set.
  3. Largest catheter possible.

- I. If signs and or symptoms of shock are present, **run the IV solution wide open, reassessing vital signs after every 250 ml.** Watch for signs of circulatory overload.
1. Run the IV at TKO if signs and symptoms of shock resolve.
  2. If the patient has **shock, IVs** should be **started en route** to the receiving facility. Do not delay transport for IV access/fluid replacement.
  3. If the patient has an **uncontrollable hemorrhage** (e.g. internal bleeding other than intracranial bleeds), fluid resuscitate to and maintain a **systolic blood pressure of 90 mmHg.**
  4. If **hemorrhage is controllable**, resuscitate to **normal vital signs.**
  5. For **children less than eight, place** an intraosseous catheter (**IO**) if IV access cannot be quickly obtained and the patient has a depressed level of consciousness so that the procedure is not extremely painful. Use **20ml/kg fluid boluses** in place of wide-open fluids. Reassess after every bolus and repeat PRN

### **EMT-3**

- J. **Monitor ECG lead II.**

### **MICP**

- K. Perform **endotracheal intubation** (by rapid sequence intubation if needed) following the **Advanced Airway Management** protocol as indicated.
- L. If the patient shows signs and symptoms of **increased intracranial pressure, contact medical control** and **consider administration of mannitol 1g/kg over 30 minutes.**

## IV. **TRANSPORT**

- A. Continue evaluation en route to a higher-level medical facility.
- B. Continue with detailed and or ongoing assessments and management as appropriate.



## SOFT TISSUE TRAUMA

### I. GENERAL POINTS

- A. Airway, breathing, circulation, and severe bleeding problems are identified and treated in the initial assessment. Once the initial assessment and the appropriate physical examination have been completed, care for the individual wounds begins.
- B. If first responders or bystanders have already dressed and bandaged the wound and the care is not causing further harm, leave it in place. Question the caregivers and patient to gather as much information about the wound as possible.

### II. ASSESSMENT

- A. Expose site and attempt to determine (unless bleeding is significant):
  - 1. Depth of wound
  - 2. Damage to underlying structures
  - 3. Any contamination
- B. Question the patient about:
  - 1. Mechanism
  - 2. Loss of function or sensation
- C. When assessing burns consider the following information:
  - 1. Look at the nose and mouth for evidence of respiratory involvement
  - 2. Was patient in a closed space with steam, smoke or toxic fumes
  - 3. Electrical contact
  - 4. Loss of consciousness
  - 5. Accompanying explosion or other trauma
  - 6. Alcohol or other drugs
  - 7. Time elapsed since burns
  - 8. Estimate of depth and extent of burns

### III. MANAGEMENT

Every provider should follow the BLS section. EMT-2 providers should follow the BLS section and the EMT-2 section. EMT-3 providers should follow the BLS, EMT-2 and EMT-3 sections. MICPs should provide the care listed for all levels plus MICP.

#### **BLS**

- A. **Follow Major Trauma protocol as indicated.**
- B. If the patient is not breathing adequately, **manage** the **airway** per the **Basic Airway Management** protocol.

- C. If the **patient is breathing adequately** but has experienced serious trauma, administer **high flow O<sub>2</sub>, 10-15 liters** (85-100 percent) **by nonrebreather**. If the patient has experienced minor to moderate trauma, O<sub>2</sub> should be provided at levels dictated by the **Pulse Oximetry Protocol**.
- D. **Control bleeding:**
1. Locate the site of bleeding from the wound and apply **direct pressure** to that site. Do not simply apply pressure and a bulky dressing to the whole injured area as this may not effectively compress the bleeding site.
  2. **Elevate** the bleeding area above the level of the heart.
  3. **Pressure points** may be used if direct pressure is not effective. Apply firm pressure to the artery proximal to the wound to stop bleeding.
  4. Consider using a **tourniquet** if the above methods fail to slow or stop bleeding. Use a wide band and compress until bleeding stops. Make note of the time the tourniquet was applied.
- E. **Treat shock:**
1. Patient should be in the supine position with feet higher than head.
  2. Administer high flow O<sub>2</sub> via nonrebreather mask, if available.
  3. Keep patient warm.
- F. **Straighten** grossly angulated **extremities**. By applying gentle traction, align the extremity in its normal anatomical position. Stop straightening if there is a significant increase in pain or resistance is felt.
- G. **Burns**
1. Thermal or electrical
    - a) Stop the burning process; be careful not to over-cool patients with large areas of burns.
    - b) Remove any smoldering clothing and jewelry on affected limbs.
    - c) Apply **moist dressings** to burns totaling **less than 10%** body surface area (BSA).
    - d) Apply a **dry dressing** to burns **over 10% BSA**.
  2. Chemical
    - a) Use care not to contaminate yourself.
    - b) Remove any clothing that had come into contact with the chemical.
    - c) Irrigate with copious amounts of water. Brush any dry products off before irrigating. Be careful and try to control the run off.
    - d) Remove any jewelry on affected limbs.
- H. Care for **all open wounds** as follows:
1. Expose the wound.
  2. Control bleeding.
  3. Clean debris from the wound surface.
  4. Dress and bandage wound.

5. For facial injuries with airway compromise from bleeding, consider positioning patient on his or her side to facilitate drainage. Spinal precautions can be maintained in this position with padding and improvisation.
- I. Treatment for **specific wounds**:
  1. Puncture wounds
    - a) Search for exit wound.
    - b) Immobilize spine if mechanism indicates.
  2. Impaled objects
    - a) Stabilize in place.
    - b) If object is in the cheek and both ends are visible, remove it by pulling it out in the direction that it entered the cheek.
    - c) Remove only if patient cannot be safely transported with object in place.
  3. Partial Avulsions
    - a) Clean the wound surface and replace the flap.
  4. Amputations and complete avulsions
    - a) Treat stump or injured site as for any soft tissue injury.
    - b) Wrap amputated or avulsed part in gauze moistened with normal saline, place part in plastic bag and keep it cool (not frozen).
  5. Open neck wound
    - a) Apply an occlusive dressing and secure, being careful not to compromise breathing.
    - b) Try to keep neck below level of heart.
- J. Pediatric Considerations
  1. Treatment for children and infants is no different than for adults, just keep in mind that overall blood volume is small and they tend to compensate longer before they show significant signs of shock.

### **EMT-2**

- K. **Consider the need to intubate** the patient with an **inhalation injury**.
- L. Establish **one or two IVs of normal saline or ringer's lactate**.
  1. Draw bloods if time allows.
  2. Use a macrodrip administration set.
  3. Largest catheter possible.
- M. If signs and or symptoms of shock are present, **run the IV solution wide open, reassessing vital signs after every 250 ml**. Watch for signs of circulatory overload.
  1. Run the IV at TKO if signs and symptoms of shock resolve.

2. For **children less than eight**, place an intraosseous catheter (**IO**) if IV access cannot be quickly obtained and the patient has a depressed level of consciousness so that the procedure is not extremely painful. Use **20ml/kg fluid boluses** in place of wide-open fluids. Reassess after every bolus and repeat PRN
  3. If the patient has **shock**, **IVs** should be **started en route** to the receiving facility. Do not delay transport for IV access/fluid replacement.
  4. If the patient has an **uncontrollable hemorrhage** (e.g. internal bleeding), fluid resuscitate to and maintain a **systolic blood pressure of 90 mmHg**.
  5. If **hemorrhage is controllable**, resuscitate to **normal vital signs**.
- N. For **burn patients**, use the following formula for fluid resuscitation. **Administer Ringer's Lactate 4ml/kg/%BSA burned** (only count 2<sup>nd</sup> or 3<sup>rd</sup> degree burns toward TBSA burned). Give ½ of the calculated amount over the first eight hours post burn and the remainder within 24 hours post burn.
1. If transport time is much delayed (>4 hrs.) administer 40 ml + weight in kg /hour of IV fluid to adults in addition to fluid needed for resuscitation. Also consider a dextrose solution if the patient is kept NPO-consult with medical control.
    - a) For children administer maintenance fluids according to Broselow tape.

### **EMT-3**

- O. If the patient is experiencing **significant pain**, **contact medical control** and **consider** administering **morphine sulfate 1-5 mg** slow IVP titrated to pain relief. May repeat PRN up to max of 10 mg.

### **MICP**

- P. **Consider** using rapid sequence intubation to **intubate the patient with an inhalation injury**.
- Q. If the patient has **circumferential full thickness burns** and decreased distal circulation and or decreased chest wall excursion, **contact medical control** and **consider** performing **escharotomy**.

## IV. TRANSPORT

- A. Transport decisions should be made based on the extent of injury and the overall condition of the patient. Isolated soft tissue injuries without shock should be considered a routine transport without lights and sirens.
- B. Continuously monitor bandaged area looking for renewed bleeding. Watch for swelling and compromises in circulation, sensation and motor functions.

## V. SPECIAL CONSIDERATIONS

- A. Delayed Transport
  1. Continuously monitor bandaged area looking for renewed bleeding. Watch for swelling and compromises in circulation, sensation and motor functions.

B. Additional therapy

1. For closed wounds and areas of swelling and pain, cold therapy may be helpful. Be careful not to freeze tissue.



# ENVIRONMENTAL



## **AVALANCHE BURIAL**

### **I. GENERAL POINTS**

- A. An avalanche incident is a medical emergency. Try to transport medical personnel and search dogs with handlers to the scene as quickly as possible, especially if it has been less than 90 minutes from the time of the avalanche. However, scene safety is the first consideration. An experienced avalanche safety person must secure the scene before other rescuers can begin on-site operations.
- B. Victims buried for less than 35 minutes should be extricated as rapidly as possible. If the person is in critical condition it is either because of acute asphyxia or trauma. After a complete burial (head and trunk buried), the person should be transported to a hospital and admitted for observation.
- C. Victims buried for more than 35 minutes are likely to be hypothermic. They should be extricated as gently as possible.
- D. An air pocket is necessary for survival. Rescuers should look for an air pocket, which is any opening around the mouth or nose. Only if the mouth and nose are completely blocked is there no air pocket.
- E. Treatment of patients in asystole depends upon core temperature or estimated duration of burial.
- F. Hypothermia should be treated according to the hypothermia guidelines.
- G. Trauma should be treated according to trauma guidelines

### **II. EVALUATION AND TREATMENT**

- A. Prevention is the most effective measure to increase avalanche survival.
- B. If someone is caught in an avalanche the best means of increasing survival is rescue by other members of the party. Every member of the party should have a shovel and an avalanche beacon and should be trained in the use of the beacon.
- C. If patient is determined to be pulseless (after a pulse check of up to 60 seconds) and burial time is estimated to be less than 35 minutes, perform CPR for up to 30 minutes.
- D. If patient is determined to be pulseless (after a pulse check of up to 60 seconds) and burial time is estimated to be more than 35 minutes, perform CPR if an air pocket is present or uncertain. If no air pocket – do not perform CPR.
- E. Assess carefully for associated injuries. Follow the Major Trauma Protocol.
- F. Follow the protocol on Hypothermia for additional therapy as needed.
- G. If the main problem is not severe hypothermia, medication should be used as in the normothermic patient

- H. Fluid therapy should be given as indicated but never at a “to keep open” rate, which may result in a frozen IV line. Boluses of warm fluid should be given as needed.

## **COLD WATER NEAR DROWNING:**

### **I. GENERAL POINTS**

- A. Cold water is defined as less than 70° F (21° C). There is no difference between fresh and salt water near drowning regarding outcome or treatment.
- B. Anyone submerged long enough to be unconscious should be transported to the hospital, even if he or she has regained consciousness. Persons surviving an immersion episode should be transported to the nearest medical facility for further evaluation. Fluid accumulation in the lungs (non-cardiogenic pulmonary edema) may develop in 6-24 hours.
- C. If the person has been under water for LESS than one hour, full resuscitative efforts should be employed. If the person has been under water for MORE than one hour, resuscitation efforts are usually unsuccessful and should not be initiated. If it is not known how long the person has been under water, consider him/her to have been submerged less than one hour, unless there are signs of prolonged immersions e.g. animal predation or skin slippage.
- D. State legislation (AS 18.08.089) has empowered EMTs, paramedics and physicians-assistants to declare death in the field following 30 minutes of properly performed advanced life support, even when the patient is hypothermic.
- E. If it does not delay rescue, maintain the patient's body in a horizontal position while removing him/her from the water.
- F. These principles apply to any near drowning, not just those in cold water. The difference between warm and cold water is that in submersions greater than 6 minutes, the chance for survival is greater in cold water than in warm water. The colder the water, the better the chance for survival.
- G. Because hypothermia is rarely profound (below 85° F (29° C) in cold water near drowning, the hypothermia aspect of the problem is less critical than the pulmonary or coagulation aspects.
- H. Many near drowning patients die of a particular type of disseminated intravascular coagulation, not from pulmonary problems.

### **II. EVALUATION AND TREATMENT**

- A. A personal flotation device should be worn by all rescuers when working on or near water.
- B. Use abdominal thrusts only when a foreign body airway obstruction is suspected.
- C. Start CPR if the patient is pulseless after a pulse check of up to 60 seconds.
- D. The CWND victim may not be severely hypothermic and should be resuscitated aggressively with CPR/ACLS.
- E. Assess carefully for associated injuries.
- F. Follow the appropriate section of the **Hypothermia** protocol (including the 60 second pulse check) for additional therapy as needed.



## DIVING EMERGENCIES

### I. GENERAL POINTS

- A. Suspect a diving emergency any time the patient developing signs/symptoms has taken a breath underwater within the past 24 hours.
- B. Consider other causes of signs and symptoms, e.g. allergic reactions, heart attacks, etc.
- C. The Divers Alert Network may be contacted ((919) 684-8111 or collect at (919) 684-4DAN) by on-scene medical personnel or by the physician managing the case.

### II. ASSESSMENT

- A. Remove the patient's dive gear and suit as carefully as his or her condition permits.
- B. Evaluate the patient's condition frequently, paying particular attention to changes in level of consciousness and respirations. Changes should be documented for later use by medical staff.
- C. Obtain and record information on patient's dive profile.
- D. Transport diving equipment with patient. The diving equipment should be left in the condition in which it was found.
- E. Be prepared to provide personnel investigating the dive with detailed information about the events and your observations.

### III. GENERAL TREATMENT

- A. If the patient is not breathing adequately, **manage** the **airway** per the **Basic Airway Management** protocol.
- B. If patient is breathing adequately, **administer O<sub>2</sub>**, 10-15 lpm by nonrebreather mask. Use a nasal cannula at 1-6 lpm if the patient is agitated by the mask.
- C. Prevent heat loss and rewarm as appropriate.
- D. Transport the patient in position of comfort, by ground, in an aircraft pressured to sea level, or by aircraft flying at lowest safe altitude (less than 1,000 feet, if possible).

### IV. MANAGEMENT-ACUTELY SICK DIVE EMERGENCY PATIENTS

Every provider should follow the BLS section. EMT-2 providers should follow the BLS section and the EMT-2 section. EMT-3 providers should follow the BLS, EMT-2 and EMT-3 sections. MICPs should provide the care listed for all levels plus MICP.

#### **BLS**

- A. Initiate rapid transport to a medical facility.
- B. Document changes in the patient's signs, symptoms, and vital signs.
- C. Anticipate seizures and treat by protecting the patient during the seizure and resuming the administration of oxygen as soon as possible.

## **EMT-2**

- D. Start an IV and give a 500 ml bolus of normal saline, followed by an infusion of 250 ml/hr.

## **MICP**

- E. If patient seizes, follow seizure protocol.

## V. MANAGEMENT-STABLE DIVE EMERGENCY PATIENTS

- A. If the patient is not receiving IV fluids, give the patient warm, non-alcoholic fluids if this can be accomplished without interrupting the delivery of oxygen. Plain water is best. Fluids containing large amounts of sugar or caffeine should be avoided because of their diuretic potential.
- B. Oxygen should be continued until the patient reaches the medical facility.
- C. Perform a baseline neurological examination which tests at least orientation, eyes, facial movement, hearing, sensory perception, and balance and coordination, if possible.
- D. Transport to a medical facility for further evaluation and treatment.

## VI. SPECIAL CONSIDERATIONS:

- A. Medevac
  - 1. The patient must be flown with the cabin altitude no higher than 1,000 feet above sea level.
  - 2. Be prepared for worsening of symptoms while at altitude.
- B. Delayed transport
  - 1. It is generally not appropriate to attempt in-water recompression. Even in a delayed transport setting, the risks of this procedure far outweigh any benefit.

# FROSTBITE

## I. GENERAL POINTS

- A. Frostbite is the freezing of tissue and may involve only superficial tissues or may extend to the bone. Simply put, damage to the frostbitten tissues is caused by crystallization of water within the tissues, typically between the cells, as well as changes in electrolyte concentration within the cells.
- B. Frostbite is frequently seen in Alaska, although, in most circumstances, the frostbite is superficial and treated by the patient at home. Occasionally, it is severe enough to warrant transport to a medical facility for evaluation and treatment. Seldom will it be necessary for emergency medical personnel to perform in-field rewarming for deep frostbite. It may, however, be necessary to treat patients with superficial frostbite who have sustained other injuries, (e.g. a motor vehicle crash patient who has been exposed to sub-zero temperatures while awaiting the arrival of rescue and medical personnel).
- C. Hypothermia and other life threatening conditions may be present in the patient with frostbite and must be evaluated and treated immediately.
- D. When caring for a patient in extremely cold temperatures, take great care to prevent hypothermia, tissues from becoming frostbitten, and already frostbitten tissues from becoming worse.
- E. Make plans for transporting the patient as early as circumstances allow. In some circumstances, when frostbite is not severe and is not complicated by other injuries and there are resources available to monitor the patient's progress, a physician should be consulted. He or she may decide the patient should not be transported. This should be clearly understood and carefully documented by the prehospital provider.
- F. Frostbitten tissues should be handled extremely gently before, during, and after rewarming.

## II. ASSESSMENT

- A. Superficial frostbite affects the dermis and shallow subcutaneous layers of the skin and is recognized by white or gray colored patches. The affected skin feels firm, but not hard. The skin initially turns red and, once frostbitten, is not painful. No tissue loss will occur when treated properly.
- B. Deep frostbite affects the dermal and subdermal layers and may involve an entire digit or body part. The skin feels hard and cold and the affected tissue is white or gray. A pulse cannot be felt in the deeply frostbitten tissue and skin will not rebound when pressed.
- C. Large blisters on the frostbitten area indicate that deep frostbite has partially thawed.
- D. Anticipate, assess and treat the patient for hypothermia, if present.
- E. Assess the frostbitten area carefully since the loss of sensation may cause the patient to be unaware of soft tissue injuries in that area.
- F. Obtain a complete set of vital signs and the patient's temperature.

- G. Obtain a patient history, including the date of the patient's last tetanus immunization.
- H. If there is frostbite distal to a fracture, attempt to splint the fracture in a manner that does not compromise distal circulation.
- I. Determine whether rewarming the frostbitten tissue can be accomplished in a medical facility. If it can, transport the patient while protecting the tissue from further injury from cold or impacts.

### III. MANAGEMENT

- A. Do not:
  - 1. rub the frozen part;
  - 2. allow the patient to have alcohol or tobacco;
  - 3. apply ice or snow;
  - 4. attempt to thaw the frostbitten part in cold water;
  - 5. attempt to thaw the frostbitten part with high temperatures such as those generated by stoves, exhaust, etc.; or
  - 6. break blisters which may form.
- B. Treatment of deep frostbite is usually extremely painful and best accomplished in a medical facility. If you can get the patient to a medical facility within a reasonable amount of time, or do not have the capability to rewarm the tissues properly or cannot prevent refreezing, you should transport the patient rather than attempt to rewarm the tissue in the field. Advice should be sought from a physician by radio or telephone before electing to rewarm frostbitten tissue in the field, whenever possible. In most circumstances, the risks posed by improper rewarming or refreezing outweigh the risks of delaying treatment for deep frostbite.
- C. If transporting a patient with frostbite that will not be rewarmed in the field, the medical provider should protect the frostbitten parts from additional injury and temperature changes.
- D. Protect the rewarmed area from refreezing and other trauma during transport. A frame around the frostbitten area should be constructed to prevent blankets from pressing directly on the injured area.
- E. Do not allow an individual who has frostbitten feet to walk except when the life of the patient or rescuer is in danger. Once frostbitten feet are rewarmed, the patient becomes nonambulatory.
- F. Shock due to frostbite is very uncommon. However, medical personnel should always be alert for shock and begin treatment at the earliest sign it is developing. If the frostbite patient develops shock, personnel should perform a thorough examination for additional injuries.

### IV. SPECIAL CONSIDERATIONS

- A. Prolonged transport

1. Tissue which is thawed and then refrozen almost always dies. Consequently, the decision to thaw the frostbitten tissue in the field commits the provider to a course of action which may involve pain control, maintaining warm water baths at a constant temperature, and protecting the tissue from further injury during rewarming and eventual transport. If rewarmed in the field, frostbitten extremities cannot be used for ambulation.
2. It is reasonable to consider rewarming the frostbitten tissue in a controlled manner if uncontrolled, spontaneous, rewarming is likely to occur during prolonged evacuation or transport.
3. If the decision is made to rewarm frostbitten tissue in the field, you should prepare a warm water bath (approximately 100-106 °F (37-40 °C)) in a container large enough to accommodate the frostbitten tissues without them touching the sides or bottom of the container.
  - a) A source of additional warm water must be available.
  - b) If possible, consult a physician regarding the administration of oral analgesics, such as acetaminophen, ibuprofen or aspirin.
  - c) Remove jewelry and clothing, if present, from the affected area.
  - d) Water should be maintained at temperature and gently circulated around the frostbitten tissue until the distal tip of the frostbitten part becomes flushed.
  - e) Pain after rewarming usually indicates that tissue has been successfully rewarmed.
  - f) Administer pain relief medications according to scope of practice.
  - g) After re-warming, let the frostbitten tissues dry in the warm air. Do not towel dry.
  - h) After thawing, tissues that were deeply frostbitten may develop blisters or appear cyanotic. Blisters should not be broken and must be protected from injury.
  - i) Pad between affected digits and bandage affected tissues loosely with a soft, sterile dressing.
  - j) Rewarmed extremities should be kept at a level above the heart, if possible.



# HEAT EMERGENCIES

## I. GENERAL POINTS

- A. Heat-related injuries fall into three major categories: heat cramps, heat exhaustion, and heatstroke.
- B. Heat emergencies are most frequent in hot, humid environments. These conditions are seldom found out-of-doors in Alaska yet still are frequently encountered. Common locations for the development of heat emergencies include engine rooms, fire grounds, factories, and athletic facilities.
- C. Athletes, workers who labor outdoors or near furnace ovens, people in poor physical condition, and the elderly are most susceptible.

## II. ASSESSMENT

### A. **Heat cramps:**

- 1. Heat cramps are muscular pains and spasms that occur when body loses too much salt during profuse sweating or when inadequate salt is taken into body.
- 2. A patient who feels thirsty may drink large quantities of water without replacing the salt, resulting in heat cramps-usually in the arms, legs, or abdomen.
- 3. Heat cramps can signal oncoming heat exhaustion. Hot weather is not necessarily a prerequisite to heat cramps.
- 4. Signs and symptoms:
  - a) Severe muscular cramps and pain, especially of the leg, calf, and abdomen.
  - b) Neuro: faintness, dizziness, exhaustion, normal mental alertness and level of consciousness.

### B. **Heat exhaustion:**

- 1. Mild state of shock brought on by pooling of blood in the skin and lower extremities. Because of pooling, blood flow is reduced to major organs. Additionally, prolonged sweating causes loss of water and salt; this contributes to hypovolemia and electrolyte imbalances.
- 2. Results from prolonged period of **fluid loss** via sweating, diarrhea or use of diuretics and exposure to warm environment **without adequate fluid and electrolyte replenishment**.
- 3. Heat exhaustion may be accompanied by-heat cramps.
- 4. Signs and symptoms:
  - a) Neuro: headache, dizziness, weakness, faintness, brief LOC, dilated pupils, difficulty with walking.
  - b) GI: loss of appetite, nausea, vomiting.
  - c) Respiratory: rapid and shallow breathing.
  - d) Skin: diaphoresis, pale, cool, ashen gray.
  - e) Cardiovascular: weak rapid pulse.

- f) Possible heat cramps.

C. **Heatstroke:**

1. Occurs when the body's **temperature reaches 105°F (40.5°C.)** Permanent disability or death may result from damaged brain cells if patient is not cooled. Altered mental status is the hallmark sign of heatstroke.
2. Generally happens one of two ways. The first is heat exposure causing progression through heat cramps, heat exhaustion to failure of the cooling mechanism which results in heatstroke. The second pathway is high exertion/low cooling in a high heat environment. An example of this latter path is a cannery worker in rain gear working in a steam filled room.
3. Signs and symptoms:
  - a) Neuro: confusion, headache, dizziness, weakness, muscular twitching, convulsions, collapse and possible unconsciousness. Pupils initially constricted then dilate.
  - b) GI: nausea and vomiting, dry mouth.
  - c) Respiratory: deep rapid snoring breathing that becomes weak and shallow.
  - d) Skin: hot, dry or sweaty and red
  - e) Temperature  $\geq 105^{\circ}\text{F}$  ( $40.5^{\circ}\text{C.}$ )
  - f) Cardiovascular: rapid, strong pulse, becoming weak, decreased blood pressure.

D. Determination of problem is based on history, signs and symptoms

E. **Aggressiveness of treatment is determined by severity:**

1. Left untreated, all heatstroke patients will die.
2. The longer the delay, the more permanent the damage.
3. EMTs should have a high **index of suspicion** for heatstroke for the following:
  - a) The aged.
  - b) Debilitated.
  - c) Malnourished
  - d) Any underlying disease.
  - e) Alcoholics.
  - f) Obesity.
  - g) Patients on anti-psychotic drugs.
  - h) Drug abuse.

III. **MANAGEMENT**

Every provider should follow the BLS section. EMT-2 providers should follow the BLS section and the EMT-2 section. EMT-3 providers should follow the BLS, EMT-2 and EMT-3 sections. MICPs should provide the care listed for all levels plus MICP.

**BLS**

- A. Remove patient to **safe environment** before starting treatment.

- B. If the patient is not breathing adequately, **manage** the **airway** per the **Basic Airway Management** protocol.
- C. If patient is breathing adequately, **administer O<sub>2</sub>**, 10-15 lpm by nonrebreather mask. Use a nasal cannula at 1-6 lpm if the patient is agitated by the mask.
- D. **Position patient** to satisfy his or her physiological needs. Supine - to protect the airway. Supine with legs elevated-if are hypotensive. In a sitting position - if not hypotensive. On side-if vomiting.
- E. **Treat for shock.**
- F. Determine if there is a **history** of heat exposure. Assess temperature of the environment and exertion level.
- G. Begin **cooling** patient.
  - 1. Patients with heat cramps should be passively cooled. Place patient in air-conditioned room or in the back of the ambulance.
  - 2. Heat exhaustion patients should have clothing removed and be placed in cool environment.
  - 3. For the heatstroke patient immediate cooling is the priority. Wet patient down. Fan briskly. Run air conditioner at high level. Use ice packs if available. Apply to groin, under the armpits, sides of chest, head and neck.
- H. Begin **oral rehydration** if indicated for non-complicated heat cramps or minor heat exhaustion. Use water or balanced electrolyte solution such as Gatorade, Allsport, etc.

### **EMT-2**

- I. Manage airway according to the **Advanced Airway Management** protocol.
- J. Establish **one or two IVs of normal saline**.
  - 1. Draw bloods if time allows.
  - 2. Use a macrodrip administration set.
  - 3. Largest catheter possible.
- K. If signs and or symptoms of shock are present, **run the IV solution wide open, reassessing vital signs after every 250 ml**. Watch for signs of circulatory overload.
  - 1. Run the IV at TKO if signs and symptoms of shock resolve.
  - 2. For **children less than eight**, **place** an intraosseous catheter (**IO**) if IV access cannot be quickly obtained and the patient has a depressed level of consciousness so that the procedure is not extremely painful. Use **20 ml/kg fluid boluses** in place of wide-open fluids. Reassess after every bolus and repeat PRN

### **EMT-3**

- L. **Monitor ECG** lead II. Treat any dysrhythmias according to the **Dysrhythmia** protocol.

### **MICP**

- M. If patient has decreased level of consciousness, insert foley catheter and infuse IV fluids to maintain urine output at 1-2ml/kg/hour.

#### IV. SPECIAL CONSIDERATIONS

- A. Prolonged transport
  - 1. Rehydration of the patient is the end goal. Continue oral rehydration until urine is clear yellow. Replace lost salts with food if plain water was given.

# HYPOTHERMIA

## I. GENERAL POINTS

- A. In the cold patient, body core temperature becomes an important sign. While obtaining a body core temperature is important and useful for assessing and treating hypothermia, there is tremendous variability in individual physiologic responses at specific temperatures and a low reading thermometer may not always be available. Therefore, these guidelines are not solely based on the patient's measured temperature.
- B. Assessment of temperature:
  - 1. The simplest assessment of a patient's body temperature may be performed by placing an ungloved hand against the skin of the patient's torso. If the skin feels warm, hypothermia is unlikely. This method, however, does not provide a reliable estimate of the patient's core temperature.
  - 2. Axillary and oral measurements are poor measures of core temperature. If temperature is measured, an esophageal or epitympanic probe should be used.
  - 3. CAUTION: Electronic thermometers may not be accurate if they are left in the cold.
- C. The hypothermic patient should be assessed carefully for coexisting injuries and illnesses. Alcohol, diabetes, altitude sickness, overdose and other conditions may mimic the signs and symptoms of hypothermia. As a result, a thorough assessment of the patient is imperative. Associated significant illness or injury may exacerbate hypothermia. Splinting should be performed, when indicated, with caution to prevent additional injuries to frostbitten tissues.
- D. Since cold skin is easily injured, avoid direct application of hot objects or excessive pressure (e.g. un-insulated hot water bottles, tourniquets).
- E. As in any resuscitation, a positive attitude is important. The hypothermic patient may appear to be beyond help because of skin color, pupil dilation, and depressed vital signs. However, patients suffering from severe hypothermia have been resuscitated. Therefore, be cautious about assuming the patient cannot be resuscitated. It is also wise to be cautious about what you say during the resuscitation. Seemingly unconscious patients frequently remember what is said and done.
- F. Severe cold injuries are encountered relatively infrequently. Consequently, it is necessary that you preplan the management of these conditions and that you are familiar with the appropriate equipment.
- G. The inside of the ambulance and any rooms where hypothermia patients are treated should be warm enough to prevent further heat loss, ideally above 26.7° C (80° F).
- H. CPR has no significant effect on survival of the hypothermic patient in the following situations, and, in accordance with state law and local standing orders, CPR should not be initiated when:
  - 1. Cold water submersion patients have been under the water for more than 1 hour.

2. Hypothermia patients with a core temperature of less than 60° F (15.5° C).
  3. Obvious fatal injuries, e.g. decapitation.
  4. Frozen patients, e.g. ice formation in the airway.
  5. The chest wall is so stiff that compression is impossible.
  6. Rescuers are exhausted or in danger.
- I. The patient with severe hypothermia must be handled very gently. The cold heart is very prone to cardiac arrest. Even cautious movement of the patient may induce cardiac arrest.
  - J. The pulse should be checked for up to 60 seconds when assessing a hypothermic patient or a patient who has been removed from cold water.

## II. ASSESSMENT

- A. **Severe Hypothermia:** If the patient is cold and has any of the following signs or symptoms, he is considered to have severe hypothermia:
  1. Altered level of consciousness, including slurred speech, staggering gait, decreased mental skills, or the lack of response to verbal or painful stimuli.
  2. Depressed vital signs, such as a slow pulse and/or slow respiration.
  3. No shivering in spite of being very cold. (Note: This sign is potentially unreliable and may be altered by alcohol intoxication.)
  4. If measured, temperature of 90° F (32 °C) or less.
- B. **Mild Hypothermia:** If the patient is cold and does not have any of these signs or symptoms, he is considered to have mild hypothermia.

## III. MANAGEMENT

Every provider should follow the BLS section. EMT-2 providers should follow the BLS section and the EMT-2 section. EMT-3 providers should follow the BLS, EMT-2 and EMT-3 sections. MICPs should provide the care listed for all levels plus MICP.

### **BLS**

- A. **All Cold Patients:**
  1. **Careful handling** is the highest priority
  2. **Prevent further heat loss.**
    - a) Remove wet clothing if in shelter. Cut clothing off to avoid excessive movement.
    - b) Cover the head and neck.
    - c) Insulate above and below.
    - d) Protect from the wind.
    - e) Apply insulated heat packs to high heat transfer/loss areas such as the head, neck, underarms, sides of the chest, and groin.
    - f) Cover with a vapor barrier (such as a plastic garbage bag).
    - g) Move the patient to a warm environment.

- h) Consider covering patient's mouth and nose with a light fabric to reduce heat loss through respirations.
  - i) Chemical heat packs slow cooling but do not rewarm. They are best used on hands and feet to prevent frostbite. They do not have enough energy to rewarm.
3. **Rewarm**
- a) **If patient is alert** enough to swallow, give **food and drinks high in calories**. The calories will increase ability to shiver which is most effective field rewarming.  
(1) *Do not give alcohol.*
  - b) Exercise drops temp and then increases it but, this is not as effective as shivering. If dry and fed and shivering, mild exercise is OK
4. Oxygen should be heated and humidified, if possible to approximately 105° F (40.5° C).
5. Splinting should be performed, when indicated, with caution to prevent additional injuries to frostbitten tissues.
6. Treat and transport to a medical facility.
- B. **Mild Hypothermia:**
- 1. Treat the patient as outlined above.
  - 2. If there is no way to get to a medical facility, rewarm the patient gradually by:
    - a) Warm showers or warm bath if the patient is alert.
    - b) Placing patient in a sleeping bag and providing contact with a warm body. The patient should **not** be placed a sleeping bag with another individual who is hypothermic. This method, however, should be considered a last resort, however, since it may endanger the rescuer and is less efficient than other methods.
- C. **Severe Hypothermia with Signs of Life (Pulse and Respirations Present):**
- 1. Treat the patient as outlined above with the following exceptions:
    - a) Do **not** put severely hypothermic patients in a shower or bath.
    - b) Do **not** give a patient oral fluids or food unless he or she is capable of swallowing and protecting his or her airway.
    - c) Do **not** attempt to increase heat production through exercise.
- D. **Severe Hypothermia with No Life Signs:**
- 1. Rewarming is key to arrest survival in hypothermia. Field techniques are ineffective. The goal is to deliver a viable patient to a facility that can perform effective rewarming (most clinics and hospitals).
  - 2. Treat as above.
  - 3. Use **mouth-to-mask** breathing.
  - 4. An AED or monitor may help determine cardiac activity. If any organized (other than VT) electrical rhythm is shown, do not start CPR.

5. If no pulse (after checking for up to 60 seconds) and no respirations and no contraindications as listed in section H in General Points, start CPR. Initiation of chest compressions should only follow careful and adequate ventilation for 3 minutes.
6. If CPR can not be continued, it should not be started.
7. If facility or transport unit is available in less than 3 hours, do not start CPR. If not, and indicated, do CPR for 30 minutes and terminate if no response.
8. If the core temperature is **86° F (30°C) or greater, defibrillation may be used** when indicated. If core is less than 86° F (30°C), one set of three stacked shocks may be given if indicated.
9. If resuscitation has been provided in conjunction with rewarming techniques for more than 60 minutes without the return of spontaneous pulse or respiration, contact the base physician for recommendations. If contact with a physician is not possible and delivery of the patient to the receiving facility will be delayed, Emergency Medical Technicians may consider terminating the resuscitation in accordance with AS 18.08.089.

### **ALS**

- E. Ventilate for at least 3 minutes with 100% O<sub>2</sub> prior to intubation attempts.
- F. Be careful to not hyperventilate patient-blows off CO<sub>2</sub> and causes vasoconstriction.
- G. IV Therapy
  1. Many hypothermic patients are dehydrated and may require aggressive fluid resuscitation. The field goal is volume expansion not rewarming.
    - a) Use bolus therapy for volume expansion to endpoint of normalization of vital signs; specifically heart rate.
  2. IV's should be heated to patient's current core temperature or greater. 98.6-104° F (37-40° C) is ideal.
  3. Do not delay transport, communications, or other therapy by taking a long time to start an IV. IVs are difficult to start in cold patients.
  4. The recommended fluid for rehydration is a balanced salt solution, such as normal saline or ringer's lactate.
  5. Do not use TKO lines in hypothermic patients. Use a saline lock.
- H. Medications:
  1. Indications for medications are the same for mildly hypothermic patients as they are for normothermic patients.
  2. In the patient with a core temperature of less than 86° F (30°C) medications should be withheld.
    - a) Medications are inefficient and poorly metabolized in the hypothermic patient. In addition, due to delayed metabolism, medications given in normal therapeutic doses to severely hypothermic patients can result in toxicity when the patient is rewarmed.

3. As with any person with altered consciousness, Narcan and 50% dextrose should be considered when there is a reasonable suspicion that their use is warranted.
  4. Sodium bicarbonate is not to be used unless specifically ordered by a physician.
- I. Arrest:
1. If any organized rhythm (other than VT) is displayed on the ECG, do not start CPR.
  2. If the cardiac rhythm is asystole, as assessed in two different leads, do not attempt defibrillation. Additional ACLS medications should be used with caution in accordance with physician signed standing orders and as stated in General Treatment



# PROCEDURES

**Note:**

*As is the case with any advanced life support treatment provided by an EMT or MICP, the following ALS procedures may only be performed under the direction of a physician, either by direct verbal communications or through physician signed standing orders.*

*Some procedures listed in this section are not authorized in the EMT Scope of Certified Activities 7 AAC 26.040. Authorization must be obtained by the service medical director through the State EMS office by following 7 AAC 26.670 before an EMT may perform those procedures.*

# **BASIC AIRWAY MANAGEMENT**

## **I. INTRODUCTION**

- A. Airway instability is a frequent cause of morbidity and mortality in major trauma patients as well as in patients with non-traumatic disorders. The two primary indications for airway management are partial or complete airway obstruction and inadequate ventilation. Field interventions should be directed at relieving obstruction and supporting ventilation.
- B. Diagnosis of the cause of airway compromise comes secondary to managing the symptoms in the field setting. Solve the problem first, then diagnose the cause and initiate specific treatment. In the end, the goal is to have the patient breathe adequately either spontaneously or with EMS intervention.

## **II. OBJECTIVES**

- A. Prevention of the spread of pathogens.
- B. Early recognition of airway instability.
- C. Interventions for the unstable airway.
  - 1. Establishment of a patent airway.
  - 2. Prevention of aspiration.
  - 3. Providing a route for administration of high concentration of O<sub>2</sub>.
- D. Ventilatory support.
- E. Provision of a route for medication administration when IV access cannot be achieved.

## **III. RECOGNITION**

- A. High risk scenarios (high likelihood of airway instability):
  - 1. Cardiac arrest.
  - 2. Coma (GCS less than or equal to 8).
  - 3. Major trauma:
    - a) closed head injury.
    - b) blunt/penetrating neck trauma.
    - c) penetrating chest injury.
    - d) severe maxillofacial injury.
  - 4. Major burns/smoke inhalation.
  - 5. Grand mal seizures.
  - 6. Ethyl alcohol/drug overdose.
  - 7. Epiglottitis.
- B. Signs/symptoms:
  - 1. Apnea.
  - 2. Tachypnea.
  - 3. Hypoxia (pulse oximeter).

4. Stridor.
5. Shallow respirations.
6. Accessory muscle retraction.
7. Gurgling.
8. Drooling.
9. Snoring
10. Dysphonia/aphonia.
11. Neck hematoma.
12. Neck crepitus.
13. Neck hemorrhage.
14. Soot within pharynx (burn patients).

#### IV. MANUAL MANEUVERS:

##### A. **Head tilt, chin lift:**

1. Rationale:
  - a) The most common cause of airway obstruction in the patient with altered consciousness is the tongue.
  - b) This procedure displaces the tongue anteriorly thus relieving the obstruction.
  - c) This procedure is easily performed and can be maintained without difficulty.
2. Indications:
  - a) The head tilt, chin lift maneuver shall be used to initially open and assure a patient airway in all non-trauma patients with altered level of consciousness.
3. Contraindications:
  - a) The head tilt, chin lift maneuver is contraindicated in cases of trauma.
4. Procedure:
  - a) Body substance isolation procedures must be used.
  - b) The EMT will place one hand on the forehead and the other hand under the chin.
  - c) The EMT will then tilt the head back without causing injury.
  - d) The EMT will then maintain this positioning until the patient is able to maintain a patent airway, or until an airway adjunct is placed.

##### B. **Modified jaw thrust:**

1. Rationale:
  - a) The modified jaw thrust also displaces the tongue anteriorly but with no movement of the cervical spine.
  - b) This technique is essential for trauma patients with altered consciousness.

- c) Maintaining the modified jaw thrust is very fatiguing on the rescuers hands so the use of this procedure is limited to initial opening of the trauma patient's airway.
- 2. Indications:
  - a) The modified jaw thrust shall be used to initially open the airway of any patient with altered consciousness when there is suspicion of trauma.
- 3. Contraindications:
  - a) There are no contraindications to this procedure, however, it may cause discomfort to the patient.
- 4. Procedure:
  - a) Body substance isolation procedures must be used.
  - b) The EMT will kneel at the patient's head and place the heel of each hand on each side of the patient's head at the temporal area.
  - c) The EMT will maintain neutral, in-line stabilization of the cervical spine by firmly holding the head with the palms of both hands.
  - d) The EMT will then place the index and/or middle finger of each hand under the angle of the jaw on each side and displace the jaw anteriorly.
  - e) The EMT should then use the thumbs to open the mouth with the application of force towards the patient's feet.
  - f) The EMT will maintain this positioning until the patient is able to maintain a patent airway, or until an airway adjunct is placed.

**C. Jaw lift:**

- 1. Rationale:
  - a) The jaw lift is also used to relieve obstruction caused by the tongue. It is accomplished by anterior movement of the jaw by the EMT.
  - b) This technique is best used for temporary positioning of the airway while an adjunct is being placed.
- 2. Indications:
  - a) This procedure is used when placing an oral airway. It is a transitional technique from manual to mechanical maneuvers.
- 3. Contraindications:
  - a) There is a high risk of injury to the EMT's fingers when performing this procedure. It is therefore contraindicated in any patient who has the potential to bite the EMT.
- 4. Procedure:
  - a) Body substance isolation procedures must be used.
  - b) The EMT will ensure that the patient is unconscious.
  - c) The EMT will then place the gloved thumb into the patient's mouth and grasp the tongue and jaw between the thumb and index finger.
  - d) The EMT will then pull anteriorly to elevate the jaw and tongue, thereby opening the airway.

- e) The EMT will maintain this position until an oral airway is placed or the patient resists.

**D. Sellick's maneuver:**

1. Rationale:
  - a) Sellick's maneuver is the application of posterior pressure on the cricoid cartilage; this occludes the esophagus between the larynx and cervical column.
  - b) This technique is valuable in the prevention of gastric distension or regurgitation.
  - c) It is also used sometimes to position the larynx for intubation.
2. Indications:
  - a) To prevent gastric distension and regurgitation when performing bag-valve-mask ventilation.
  - b) When needed (requested), to position the larynx for intubation.
3. Contraindications:
  - a) This procedure is relatively contra-indicated in pediatric patients because the trachea is soft and easily occluded. It is also difficult to identify the anatomy in pediatric patients.
4. Procedure:
  - a) Body substance isolation procedures must be used.
  - b) The EMT will palpate for the cricoid cartilage. It is the cartilage ring located just inferior to the depression below the thyroid cartilage (Adam's apple).
  - c) The EMT will then place the thumb and index fingers of one hand on the cricoid cartilage just lateral to midline bilaterally.
  - d) The EMT will apply firm posterior pressure to the cartilage.
  - e) The pressure should be maintained until the patient is intubated, BVM ventilation is not needed, or a gastric tube has been placed and attached to low intermittent suction.

**V. BASIC MECHANICAL ADJUNCTS:**

**A. Oropharyngeal (Oral) airway:**

1. Rationale:
  - a) The oropharyngeal airway holds the tongue away from the posterior pharynx ensuring a patent airway without the need for constant positioning.
2. Equipment needed:
  - a) Infection control supplies.
  - b) Suction device.
  - c) Bag-valve-mask.
  - d) Oxygen cylinder and regulator.
  - e) Oropharyngeal airways (assorted sizes).

- f) Stethoscope
  - g) Tongue blade (optional).
3. Indications:
- a) The oral airway should be used as tolerated for any patient with altered consciousness or airway insufficiency.
  - b) After successful endotracheal intubation, the oral airway should be inserted to serve as a bite block.
4. Contraindications:
- a) The oral airway is contraindicated in patients who do not tolerate insertion of the device. (i.e. gag reflex)
5. Procedure:
- a) Body substance isolation procedures must be used.
  - b) The EMT will ensure the patient is unconscious and does not have a gag reflex.
  - c) The EMT shall choose the appropriate size airway according to either of the following rules.
    - (1) *Center of patient's mouth to corner of jaw.*
    - (2) *Corner of patient's mouth to earlobe.*
  - d) The airway should be suctioned as needed.
  - e) The EMT will perform a Jaw lift on the patient.
  - f) While performing the Jaw lift, the EMT will insert the oral airway upside down (tip facing palate) into the patient's mouth until resistance is met.
  - g) The EMT will then rotate the airway 180 degrees and continue insertion until the airway is flush against the patient's upper teeth or gums.
  - h) An alternate method must be used for insertion in pediatric patients and may be used for adults.
    - (1) *Use a tongue blade to anteriorly displace the jaw and tongue.*
    - (2) *Insert the airway following the natural curvature of the pharynx until it is flush with the teeth or upper gum.*
  - i) After insertion by either method, reassess for a patent airway.
    - (1) *good chest rise and fall;*
    - (2) *correction of abnormal breathing sounds;*
    - (3) *strong equal lung sounds;*
    - (4) *good compliance with BVM ventilation;*
    - (5) *improvement in patient status.*
6. Cautions:
- a) The oral airway can actually cause an airway obstruction if improperly placed.
  - b) Avoid this complication by ensuring that the tongue is displaced anteriorly during insertion.

- c) Oral airways have a tendency to become easily dislodged. Continually reassess.

**B. Nasopharyngeal (Nasal) Airway:**

1. Rationale:
  - a) The nasal airway is well tolerated by those patients who have a gag reflex or are semiconscious but have an obstruction from the tongue.
  - b) The nasal airway is also useful when the mouth is inaccessible. For example: oral trauma, clenched jaw, or swelling.
2. Equipment needed:
  - a) Infection control supplies.
  - b) Suction device.
  - c) Bag-valve-mask.
  - d) Oxygen cylinder and regulator.
  - e) Assorted size nasal airways.
  - f) Stethoscope
  - g) Water soluble lubricant.
3. Indications:
  - a) The nasal airway is to be used in any patient who cannot maintain his or her airway but will not tolerate an oral airway.
4. Contraindications:
  - a) The nasal airway is contraindicated in any patient who may have a facial or lower skull fracture.
  - b) This airway is also contraindicated if the nose is obstructed.
5. Procedure:
  - a) Body substance isolation procedures must be used.
  - b) The EMT will use a manual maneuver to open the airway and maintain it until the adjunct is placed.
  - c) The EMT shall select the appropriate size airway according to the following rules.
    - (1) *Length: Tip of the patient's nose to the tip of the patient's earlobe.*
    - (2) *Diameter: Use the airway that is just under the size of the patient's nostril.*
    - (3) *If the airway is the proper diameter but is too long, the EMT will adjust the length by either sliding the collar or wrapping tape around the airway.*
  - d) The EMT will generously lubricate the airway with water-soluble lubricant.
    - (1) *Lidocaine jelly may be used if authorized.*
    - (2) *Pretreatment with Neosynephrine may be used if authorized.*
  - e) Insertion should first be attempted in the right nostril. Proceed to the left if unsuccessful through the right nostril.

- f) The bevel of the airway must point towards the septum.
    - (1) *This requires 180 degree rotation of the airway if the left nostril is used.*
  - g) The EMT will gently insert the airway into the nostril, directing it posteriorly and following the natural curvature of the nasopharynx.
  - h) If resistance is encountered during insertion, DO NOT USE FORCE, withdraw slightly, rotate the airway slightly and re-attempt.
  - i) The EMT will continue to advance the airway until it is almost completely inserted.
  - j) The EMT will ensure the tongue is anterior (manual maneuvers) and continue to insert the nasal airway until the flange is seated against the nose.
  - k) The EMT will assess for a patent airway:
    - (1) *good chest rise and fall;*
    - (2) *correction of abnormal breathing sounds;*
    - (3) *strong equal lung sounds;*
    - (4) *good compliance with BVM ventilation;*
    - (5) *improvement in patient status.*
  - l) If the left nostril is used, the procedure changes as follows:
    - (1) *Airway is rotated 180 degrees so that the bevel points towards the septum.*
    - (2) *Insertion is done in posterior direction until resistance is met.*
    - (3) *The airway is then rotated gently 180 degrees and insertion completed as above.*
6. Cautions:
- a) The lining of the nasopharynx is extremely vascular and will bleed copiously if damaged. It is important to avoid damaging the nasal mucosa.
  - b) Finesse is the key to this procedure. It should never be forced. If force is necessary, something is wrong; try the other nostril.
  - c) Lubrication is ESSENTIAL for this technique. The more lubrication the less chance of trauma.
  - d) If the airway is too long or too short, it will not hold the tongue out of the way or the gag reflex may be stimulated. Avoid this through proper sizing.

## VI. VENTILATION:

### A. Introduction:

- 1. A **patent airway** is necessary before attempting ventilation.
- 2. Follow the **Manual Maneuvers**, **Suctioning**, and **Basic Mechanical Adjuncts** protocols.
- 3. Attempts to ventilate are essentially useless until an open airway has been established.

- a) Consider placing more than one basic adjunct e.g., two NPAs or an NPA with an OPA.
- 4. Unprotected mouth to mouth or mouth to nose ventilation techniques expose the rescuer to many infectious agents and as such, are not to be used by the professional rescuer.
- B. **Mouth to Mask Ventilation:**
  - 1. This technique should be used until a bag-valve-mask is available.
    - a) Place the mask or barrier with one way valve on patient and establish and maintain a good seal.
    - b) Deliver a breath through the one way valve until the patient's chest rises.
    - c) Stop and allow for exhalation.
    - d) Continue to ventilate the patient at a rate of 12-20 breaths per minute until a bag-valve-mask is available.
- C. **Bag-Valve Mask-(Adult):**
  - 1. Rationale:
    - a) Through the use of one way valves, the bag-valve-mask (BVM) device helps ensure body substance isolation while delivering ventilations.
    - b) Proper use of a BVM, with an O<sub>2</sub> reservoir or demand valve attached, allows delivery of O<sub>2</sub> concentrations approaching 100%.
    - c) The BVM allows the rescuer to "feel" how much volume is delivered into a patient's lungs and to evaluate the resistance to ventilation.
    - d) The bag-valve device can be used with a mask, endotracheal tube, or tracheotomy tube.
    - e) Generally, the amount of air exchange is based on the adequacy of the mask seal. A good seal is vital to ensure adequate tidal volumes.
    - f) The factors affecting the delivery of adequate ventilation are rate and volume. If either is lacking, the patient will suffer.
    - g) **The BVM is best used by two EMTs.**
      - (1) *Use two-rescuer technique whenever BVM ventilation is required and sufficient personnel are present.*
  - 2. Equipment Needed:
    - a) Infection control supplies.
    - b) Suction device.
    - c) Bag-valve-mask.
    - d) Oxygen cylinder and regulator.
    - e) Demand valve or O<sub>2</sub> reservoir for BVM.
    - f) Assorted size oral or nasal airways.
    - g) Stethoscope.
  - 3. Indications:
    - a) The BVM should be used for any patient with the following conditions:

- (1) *apnea;*
  - (2) *respiratory rate greater than 30 or less than 10;*
  - (3) *inadequate or insufficient ventilation within any respiratory rate.*
4. Contraindications:
  - a) There are no contraindications to the use of a bag-valve-mask.
5. Procedure:
  - a) The EMT will open the patient's airway manually and then place an appropriate basic airway adjunct.
  - b) The EMT will assemble the BVM device and attach supplemental O<sub>2</sub>.
    - (1) *demand valve or;*
    - (2) *reservoir with supply tubing, O<sub>2</sub> running at 15 liters per minute.*
    - (3) *do not delay initial ventilation to attach O<sub>2</sub> but attach it as soon as possible.*
  - c) The EMT will select a mask that seals on the patients face.
  - d) The EMT will have an assistant perform Sellick's maneuver.
  - e) The EMT will seal the mask on the patient's face.
    - (1) *If one rescuer technique; the EMT will form a "C" shape with thumb and index finger to hold the mask, and use the other fingers to clench the mask to the face by grasping the lower edge of the mandible and elevating it.*
    - (2) *If two rescuer technique; the EMT will use both hands to seal the mask as per the above method.*
  - f) The EMT will then compress the bag to deliver a volume of to make the chest rise.
    - (1) *If one rescuer; the EMT will compress the bag with one hand over 1-2 seconds. The EMT should try to compress the bag against his body (arm or knee) to increase tidal volume.*
    - (2) *If two rescuer; one rescuer will maintain seal while the other compresses bag with both hands over 1-2 seconds to deliver adequate tidal volume.*
  - g) The EMT will assess for adequacy of delivered ventilations
    - (1) *good chest rise and fall;*
    - (2) *strong equal lung sounds;*
    - (3) *good compliance with BVM ventilation;*
    - (4) *improvement in patient status.*
  - h) If the initial ventilation does not go in, then reposition the airway and re-attempt.
  - i) If two attempts to ventilate and reposition are unsuccessful, then proceed to the **Obstructed Airway** protocol.

- j) If ventilations are successful, continue to ventilate at a rate of 12-20 breaths per minute (12 breaths per minute is one every 5 seconds and 20 breaths per minute is one every 3 seconds) with the following exceptions:
    - (1) *In preparation for intubation or suctioning, hyperventilate at 30 breaths per minute for 30 to 60 seconds before the attempt.*
  - k) The EMT will assess for adequate ventilations with BVM device:
    - (1) *good chest rise and fall;*
    - (2) *strong equal lung sounds;*
    - (3) *good compliance with BVM ventilation;*
    - (4) *improvement in patient status.*
  - l) Continue to ventilate the patient at 12 -20 breaths per minute until no longer indicated.
  - m) Ventilation should not be interrupted for more than 30 seconds at a time.
6. Cautions:
- a) The most common mistake that results in inadequate ventilation is a poor mask seal. This can be overcome by using two EMTs for this procedure.
  - b) Other common pitfalls include ventilating the patient too fast, not allowing the lungs to deflate between breaths, and making the inspiratory phase too fast. All of the above problems result in lowered tidal volume, gastric distension, and decreased lung expansion.
  - c) Remember that air will follow the path of least resistance; be it around the mask or down the esophagus. A good seal, patent airway, appropriate rate, allowance for exhalation, and proper timing of inspiration ensures that the air goes into the lungs and ventilates the alveoli.

## VII. SUCTIONING:

- A. Suctioning is essential in the maintenance of a patent airway. Anytime liquids or solid substances are in the airway, there is a high potential of airway obstruction and/or aspiration.
  - 1. Airway obstruction causes decreased air flow to the lungs which results in hypoxia.
  - 2. Aspiration of vomitus will cause infection in the lungs and often causes death.
  - 3. Initial suctioning is the top care priority. Suctioning establishes a patent airway. A suction device should be carried in the jump kit.
- B. **Pharyngeal Suction:**
  - 1. Rationale:
    - a) As noted above when fluid or solids are present in the airway, they cause compromise of the patient.

- b) Materials that are commonly present and need to be removed from the airway include:
    - (1) *blood;*
    - (2) *saliva;*
    - (3) *vomit;*
    - (4) *teeth;*
    - (5) *food.*
  - c) Application of suction to the pharynx removes these substances and provides for a clear patent airway.
  - d) Removal of materials from the airway should be performed initially before ventilating the patient and as needed thereafter.
    - (1) *Initial removal is essential in order to prevent ventilation from pushing any substances down into the lower airway.*
2. Equipment needed:
- a) Infection control supplies.
  - b) Suction device.
  - c) Suction tubing.
  - d) Yankauer suction catheter.
  - e) Soft suction catheter. (French)
  - f) bag-valve-mask.
  - g) Oxygen cylinder and regulator.
  - h) Demand valve or O<sub>2</sub> reservoir for BVM.
  - i) Assorted size oral or nasal airways.
  - j) Stethoscope.
3. Indications:
- a) Pharyngeal suctioning is indicated whenever substances like blood, mucus, vomit, food particles etc. are present in the upper airway.
4. Contraindications:
- a) Hypoxia is a relative contraindication to pharyngeal suctioning.
  - b) However, it may be necessary to remove matter from the airway to prevent hypoxia.
  - c) Pre-ventilation with 100% O<sub>2</sub> reduces hypoxia associated with suctioning.
5. Procedure:
- a) Body substance isolation procedures must be used.
  - b) The EMT will assess the need for suctioning via auscultation and visualization of the upper airway. If gurgling is heard or materials are visualized in the airway the EMT will select an appropriate device for suctioning.
    - (1) *The Yankauer or “tonsil tip” is generally most useful for pharyngeal suctioning.*

- (2) *If large particles are present, the suction tubing may need to be used without any attachment.*
    - (3) *A soft catheter is useful for suctioning of the nasopharynx.*
  - c) The device shall be inserted into the patient's mouth or nose as needed without applying suction.
  - d) When the desired area is reached, suction shall be applied and the device moved around in the pharynx to ensure removal of all substances.
  - e) The EMT shall repeat this procedure as needed until the airway is clear.
  - f) Immediately after each suction attempt, the EMT will hyperventilate patient for thirty seconds with 100 % O<sub>2</sub>.
6. Cautions:
- a) Positioning the patient on his side will facilitate the drainage of large quantities of vomitus or blood.
    - (1) *This shall be done anytime a patient vomits.*
    - (2) *Ensure spinal immobilization for trauma patients before turning.*
  - b) Suctioning causes hypoxia because the patient is not breathing during the procedure. Patients must be hyperventilated (one breath every two seconds) for thirty seconds after each attempt.
  - c) The EMT may need to manually remove large pieces of debris from the airway.

#### VIII. TABLE OF TREATMENT ADJUNCTS:

Adjunct	Indications	Contraindications	Comments
Suction	Indispensable for all patients with fluid or particulate debris in airway	None	No more than 15 seconds per attempt
Modified jaw thrust	Initial airway maneuver for all trauma patients	None	None of these adjuncts protects against aspiration in patient with depressed consciousness
Hyperextension of neck	Opening airway of non-trauma patient	Potential cervical spine injury	
Nasal airway	Obstruction by tongue with gag reflex present	Potential mid-face injury	
Oral airway	Obstruction 2° to tongue, etc.	Positive gag reflex	

## ADVANCED AIRWAY MANAGEMENT

### I. GENERAL POINTS

- A. This protocol is to be followed after completion of all indicated items in the **Basic Airway Management** protocol.
- B. Oral endotracheal intubation by direct viewing on an unconscious patient, placement of a laryngeal mask airway, and dual lumen airway device placement may be performed by EMT-2 & 3 personnel. The other procedures listed in this protocol may only be performed by MICPs.

### II. DUAL LUMEN AIRWAY DEVICE

- A. This device was designed for blind insertion and may be used as a rescue airway in the event of failed intubation or by less experienced providers.
- B. Two devices are marketed today, the Esophageal Tracheal Combitube (ETC), in sizes adult and small adult, and the Pharyngeal Tracheal Lumen (PTL) airway.
- C. Equipment needed:
  - 1. Infection control supplies.
  - 2. Suction device.
  - 3. Bag-valve-mask.
  - 4. Oxygen cylinder and regulator.
  - 5. Demand valve or O<sub>2</sub> reservoir for BVM.
  - 6. Dual Lumen airway
  - 7. 100 ml and 30 ml Syringe to inflate cuffs
  - 8. Stethoscope.
- D. Indications
  - 1. Intubation alternative for less experienced providers.
  - 2. Difficult airway.
  - 3. Failed intubation.
- E. Contraindications
  - 1. Patients under age 16
  - 2. Intact gag reflex
  - 3. Known esophageal disease
  - 4. Caustic ingestion
- F. Procedure
  - 1. Take body substance isolation precautions
  - 2. Hyperventilate patient with 100% oxygen
  - 3. Check/prepare airway device
  - 4. Lubricate distal tip of the device
  - 5. Position the head properly
  - 6. Perform a tongue-jaw lift

7. Combitube<sup>®</sup>
    - a) Use Combitube SA<sup>®</sup> for patients 4- 5 ½ feet tall and Combitube<sup>®</sup> for patients 5 feet and taller.
    - b) Insert device in mid-line to depth so printed ring is at level of teeth
    - c) Inflate pharyngeal cuff with proper volume and remove syringe
    - d) Inflate distal cuff with proper volume and remove syringe
  8. PTL<sup>®</sup>
    - a) Insert device in mid-line until bite block flange is at level of teeth
    - b) Secure strap
    - c) Blow into tube #1 to adequately inflate both cuffs
  9. Attach BVM to the first (esophageal placement) lumen and ventilate. If lung sounds are present, and no sounds are heard over epigastrium, continues ventilating through this lumen.
  10. If no lung sounds are audible, and epigastric sounds are heard, switch the BVM to the other lumen and ventilate.
  11. Confirm placement and ventilation through correct lumen by observing chest rise, auscultation over the epigastrium, and bilaterally over each lung.
  12. Confirms tube placement with an end tidal CO<sub>2</sub> detector device.
- G. Cautions
1. Esophageal tears have been associated with dual lumen airways.

### III. LARYNGEAL MASK AIRWAY (LMA)

- A. Rationale:
1. This device was designed for blind insertion and may be used as a rescue airway in the event of failed intubation or by less experienced providers.
- B. Equipment needed:
1. Infection control supplies.
  2. Suction device.
  3. Bag-valve-mask.
  4. Oxygen cylinder and regulator.
  5. Demand valve or O<sub>2</sub> reservoir for BVM.
  6. Assorted size laryngeal mask airways.
  7. Water soluble lubricant.
  8. Syringe to inflate LMA cuff.
  9. Stethoscope.
- C. Indications:
1. Intubation alternative for less experienced providers.
  2. Difficult airway.
  3. Failed intubation.
- D. Contraindications:

1. Vomiting
  2. Gag reflex
- E. Procedure:
1. Body substance isolation procedures must be used.
  2. Size the device according to patient body weight listed on LMA.
  3. Lubricate posterior surface of device with a water soluble lubricant (K-Y Jelly).
  4. Pre-oxygenate the patient.
  5. Hold the LMA like a pen, the mask aperture must face forward and the black line on the airway tube faces toward the nose.
  6. Press the tip of the cuff upward against the hard palate and flatten the cuff against it.
  7. Using the index finger to guide the LMA, press backwards towards the ears in one smooth movement.
  8. Advance into the hypopharynx until a definite resistance is felt.
  9. Gently maintain pressure on the tube while removing the index finger.
  10. Inflate the cuff with just enough air to obtain a seal.
  11. Confirm placement and ventilation by observing chest rise, auscultation over the epigastrium, and bilaterally over each lung.
  12. Confirm tube placement with an end tidal CO<sub>2</sub> detector device.
  13. Insert bite block.
  14. Secure tube with tape.
- F. Cautions:
1. The LMA does not prevent regurgitation or aspiration.
  2. LMA placement should not be used as a substitute for tracheal intubation when that option is available.

#### IV. ENDOTRACHEAL INTUBATION:

- A. Placement of a tube into the trachea provides the most secure airway available.
- B. Endotracheal intubation provides a direct route into the lungs. This allows easier ventilation, administration of medications, reduction of aspiration risk, direct control of airway pressures, and suctioning of the lower airway.
- C. The orotracheal direct viewing method is the preferred technique. Advantages are:
  1. Placement is confirmed by direct viewing of the tube passing into the trachea.
  2. The procedure is rapidly performed and does not require the patient to be breathing.
  3. Risk to the rescuer is minimized.
- D. Intubation should not be withheld merely because of the possibility of a neck injury. The procedure is modified, but intubation should be performed if it is otherwise needed for airway stabilization.

E. **Orotracheal Direct Viewing (non-trauma patient):**

1. Rationale:
  - a) This technique allows the medic to directly view the glottis and direct the tube through the vocal cords minimizing the chance of misplacement.
  - b) It is necessary to extend the neck for this procedure. Do not use this procedure for trauma patients.
2. Equipment needed:
  - a) Infection control supplies.
  - b) Suction device.
  - c) Bag-valve-mask (BVM)
  - d) Oxygen cylinder and regulator.
  - e) Demand valve or oxygen reservoir for BVM.
  - f) Assorted size oral or nasal airways.
  - g) Stethoscope.
  - h) Assorted size endotracheal tubes (ET tube).
  - i) Laryngoscope with straight and curved blades.
  - j) 10cc syringe.
  - k) Intubating stylet.
  - l) Umbilical tape or gauze.
3. Indications:
  - a) Airway obstruction.
  - b) Cardiac Arrest
  - c) Prolonged bag-valve mask ventilation
  - d) Patient inability to protect airway.
  - e) Shock, coma, severe head injury with Glasgow Coma score  $\leq 8$ .
  - f) Severe respiratory distress that is not improved after treatment.
  - g) Flail chest or other severe chest injuries
  - h) Inhalation injuries.
  - i) Early intubation is strongly recommended for patients who have burns to the head, neck, or upper chest.
4. Contraindications:
  - a) Trauma-must use modified technique if cervical spine trauma is a possibility.
  - b) Patient intolerance is only a relative contraindication to this procedure.
5. Procedure:
  - a) Secure the airway with basic manual and mechanical maneuvers.
  - b) Pre-oxygenate the patient with 100% O<sub>2</sub>
    - (1) *Hyperventilate the patient (one breath every two seconds) for at least one minute before attempting endotracheal intubation.*

- (2) *Or if patient is breathing adequately, give 15 lpm via non rebreather mask for 3 minutes.*
- c) Assess lung sounds before intubation. This provides a baseline for evaluating lung sounds after intubation.
- d) Prepare the intubation equipment.
  - (1) *Assemble the laryngoscope and check the light.*
    - (a) *It is acceptable to use either the straight or curved blade according to personal preference.*
    - (b) *Use a blade appropriately sized to the patient*
  - (2) *Choose an appropriate size ET tube.*
    - (a) *Tip of patient's little finger*
    - (b) *Size of patient's nostril*
  - (3) *Insert a stylet in the ET tube ensuring that it does not extend past the Murphy eye.*
    - (a) *Bend the ET tube/stylet assembly to a "hockey stick" type shape.*
    - (b) *If the angle is too severe, it may cause difficulty in passing the tube.*
  - (4) *Test the integrity of the cuff by inflating with 10 ml of air, removing the syringe, and squeezing the cuff. If it is patent, remove the air leave syringe attached.*
  - (5) *Ensure that ancillary equipment such as suction, stethoscope and a tie for the tube are readily available.*
- e) Position the patient for intubation.
  - (1) *For most patients, the neck should be straight and the head positioned in a sniffing or slightly extended position.*
    - (a) *Use a pillow, blanket, or other padding under the occiput to maintain this position.*
    - (b) *Elevation of the shoulders is generally counterproductive.*
  - (2) *A neutral or slightly flexed position is best for patients who are obese, have short necks, or are otherwise anterior. Padding under the head will help maintain this position.*
- f) When prepared, ask the non-intubating partner to stop ventilating the patient and remove the oral airway.
- g) Open the patient's mouth and insert the laryngoscope.
  - (1) *Enter on the right side of the mouth and use the ridge on the blade to sweep the tongue to the left side of the mouth.*
- h) Continue to advance the blade while lifting slightly until:
  - (1) *If using the curved, it is positioned in the vallecula.*
  - (2) *If using the straight, the tip of the blade is placed posterior to the epiglottis.*
- i) Apply upward force to elevate the mandible and tongue; allowing a view of the vocal cords.

- (1) *The laryngoscope is a scoop not a lever.*
  - (2) *Sellick's maneuver is helpful at this time.*
  - (3) *Backward, upward, rightward, pressure (BURP) on the larynx may also facilitate viewing. The intubator should direct the assistant's hand with his hand.*
  - (4) *A locked wrist helps prevent using the teeth as a fulcrum.*
  - (5) *Keeping the arm and back straight also facilitates a better view with more control and less chance of levering on the teeth.*
  - (6) *The head should essentially be suspended from the mandible by the laryngoscope blade.*
- j) Suction the pharynx as needed for an unobstructed view.
- (1) *Sellick's maneuver should be used if there is regurgitation.*
- k) When the vocal cords are in view, pass the ET tube through the glottis.
- (1) *Pass the tube to the right of the blade and advance it until the cuff is just past the vocal cords.*
  - (2) *Do not attempt to pass the tube down the channel of the blade. Doing so obstructs the view and often the channel is too small to accommodate the tube. There is also a strong risk of damaging the cuff.*
- l) Before removing the laryngoscope, visually confirm that the tube is through the vocal cords.
- m) No more than 30 seconds may be used per attempt.
- (1) *Re-ventilate for at least 30 seconds after each attempt.*
  - (2) *Some situations such as copious vomiting or bleeding may require more than 30 seconds. These are the exception; not the norm.*
- n) Hold the tube close to the mouth and remove the stylet.
- o) Inflate the cuff of the endotracheal tube with 5-10 ml of air.
- p) Attach the bag-valve device to the ET tube and ventilate the patient.
- q) Using the following techniques, assess for proper tube placement.
- (1) *Ability to easily aspirate air with an esophageal detector device*
  - (2) *Chest rise with ventilation*
  - (3) *Color change of end tidal CO<sub>2</sub> detector (may give false negative in low flow states)*
  - (4) *Confirmation of lung sounds in the apices and bases bilaterally*
  - (5) *Absence of epigastric sounds*
  - (6) *Direct viewing*
  - (7) *Inability to make sounds with the vocal cords.*
  - (8) *Good compliance with ventilation*
  - (9) *Improvement in patient status.*

- r) If placement cannot be confirmed, remove the ET tube, ventilate the patient with BVM, and make another attempt.
    - (1) *If there is any doubt about proper placement, remove the tube.*
    - (2) *BVM ventilation is always preferable to an unconfirmed intubation.*
  - s) Ventilate the patient at 12-20 breaths per minute. (1 breath every 3-5 seconds.)
  - t) If proper placement is confirmed, note the number on the tube at the level of the teeth, (about 22 cm on adult male) and secure the tube.
  - u) Insert a bite block.
  - v) Continually reassess for proper tube placement and document findings with all of the above criteria for confirmation of tracheal placement.
    - (1) *Reassess every time the patient is moved*
    - (2) *Reassess anytime patient status changes.*
  - w) Placing the tube is the easy part. Maintaining proper position is a challenge.
6. Cautions:
- a) Intubation should not be the first method of airway support used to treat a patient with unstable airway. Patients should be ventilated with the bag-valve-mask device while preparations are made for intubation.
  - b) Intubation should **not** be withheld in the awake or breathing patient where intubation is indicated. An intact gag reflex is not a contraindication to this procedure. MICPs should use rapid sequence intubation to intubate this class of patients.
    - (1) *The awake patient who is tiring from respiratory failure from COPD or pulmonary edema, and in whom non-invasive respiratory support is not adequate, should be intubated before he or she deteriorates to a complete cardiac and/or respiratory arrest.*
    - (2) *Sellick's maneuver will help success.*
    - (3) *Suction must be readily available.*
  - c) The unconscious or obtunded but breathing patient in whom no gag reflex is present is at high risk for aspiration. Intubation should be strongly considered.
    - (1) *Sellick's maneuver should be used until this patient is intubated.*
  - d) An unconscious but breathing patient who becomes combative with attempts at intubation will usually be able to protect his or her airway. Rapid transport is preferable to prolonged attempts at intubating a combative patient.

- e) Always carefully check the position of an ET tube by auscultation, clinical status, end tidal CO<sub>2</sub> detection, and direct viewing. Remove if placement is in doubt. Displacement of an endotracheal tube is an accepted complication; failure to recognize and correct a misplaced ET tube is not.
- f) Endotracheal tubes move during movement of the patient. Protect ET tubes from unnecessary movement and recheck position and placement frequently. Apply a cervical collar to reduce neck movement.

**F. Orotracheal Direct Viewing (Traumatic Mechanism of Injury):**

1. Rationale:
  - a) In trauma patients, the need for airway support and cervical stabilization is equal. Because of this, the standard technique must be modified.
  - b) This technique allows the medic to partially view the glottis and place the tube with visual confirmation while maintaining spinal precautions.
  - c) The benefit and liability of this technique is that the head and neck are not moved. This protects the cervical spine but limits the view of the glottis.
  - d) Because of the compromised view, a strong understanding of anatomy is key to the success of this procedure.
2. Equipment needed:
  - a) Infection control supplies
  - b) Suction device
  - c) Bag-valve-mask
  - d) Oxygen cylinder and regulator
  - e) Demand valve or oxygen reservoir for BVM
  - f) Cervical collar
  - g) Assorted size oral or nasal airways
  - h) Stethoscope
  - i) Assorted size endotracheal tubes
  - j) Laryngoscope with straight and curved blades
  - k) 10cc syringe
  - l) Intubating stylet
  - m) Umbilical tape or gauze
3. Indications:
  - a) Any of the previous indications in the setting of trauma.
4. Contraindications:
  - a) Patient intolerance is a relative contraindication to this procedure.
5. Procedure: Follow the steps for Orotracheal Direct Viewing with the following differences:

- a) While maintaining spinal precautions, secure the airway with basic manual and mechanical maneuvers.
  - b) Apply a cervical collar to the patient.
  - c) Prepare the intubation equipment.
    - (1) *Assemble the laryngoscope and check the light.*
      - (a) *Because of the limited space in the oropharynx caused by not moving the neck, the straight blade should be used for this procedure. It displaces the tongue more and allows direct control of the epiglottis.*
    - (2) *Insert a stylet in the ET tube ensuring that it does not extend past the Murphy eye.*
      - (a) *A stylet is mandatory for this procedure.*
      - (b) *Bend the ET tube /stylet assembly to a “hockey stick” type shape.*
      - (c) *If the angle is too severe, it may cause difficulty in passing the tube.*
  - d) The non-intubating partner will hold in-line spinal immobilization while positioned alongside the patient. Remove the anterior aspect of the cervical collar.
  - e) Unless there is a risk of contamination, immobilize the patient’s head between your legs.
    - (1) *Kneel or sit on the floor.*
      - (a) *If kneeling, the head is between the medic’s knees.*
      - (b) *If sitting, the head is between the medic’s thighs.*
    - (2) *If there is a strong risk of contamination from sitting or kneeling on the floor, only the non-intubating partner alongside the patient shall hold cervical immobilization.*
  - f) Both the non-intubating partner and medic should be holding spinal immobilization at this time.
    - (1) *The non-intubating partner holds the head with his hands.*
    - (2) *The intubator holds the head with his legs.*
  - g) The head and neck must not be moved during laryngoscopy.
  - h) There will be a limited view of the glottis. Sometimes, only the posterior cartilage will be visible. If so, the tube should be directed superior to the cartilage.
6. Cautions:
- a) Spinal precautions should not be compromised in order to effect an intubation. If unable to perform a trauma intubation, the patient should be ventilated with a bag-valve-mask device.
  - b) An intact gag reflex is not a contraindication to this procedure.
    - (1) *Sellick’s maneuver will help success.*
    - (2) *Suction must be readily available.*

- c) Because this procedure offers a limited view of the glottis, confirmation of proper placement is paramount. Documentation of this confirmation is also a very high priority.
- d) All of the aforementioned cautions apply to trauma intubation.

## V. RAPID SEQUENCE INTUBATION (RSI) (MICP Level Only)

- A. RSI refers to the nearly simultaneous administration of a sedative agent and a neuromuscular blocking agent to induce motor paralysis and unconsciousness for the purpose of facilitating endotracheal intubation.
- B. INDICATIONS:
  - 1. to assist in intubation of a conscious or semi-conscious patient;
  - 2. to allow transport of critically ill or injured combative patients;
  - 3. and to minimize increases in intracranial pressure during intubation.
- C. CONTRAINDICATIONS
  - 1. Cardiac arrest.
  - 2. Predicted difficult airway (relative.)
    - a) Less than 3 finger width jaw opening;
    - b) less than 3 fingers from chin to hyoid;
    - c) less than 3 fingers from thyroid cartilage to sternal notch.
- D. EQUIPMENT NEEDED:
  - 1. Monitoring devices - cardiac, pulse oximetry, BP cuff, end tidal CO<sub>2</sub> detector
  - 2. Endotracheal tubes of various sizes with cuff as appropriate.
  - 3. Stylet
  - 4. Laryngoscope and blades-curved or straight.
  - 5. Suction equipment (tonsil tip, endotracheal)
  - 6. Securing device
  - 7. 10 ml Syringe
  - 8. Devices for insuring correct placement
  - 9. A BVM supplied with 100% O<sub>2</sub>
  - 10. Magill forceps-to remove foreign body or assist tube placement
  - 11. Advanced airway equipment, in the event of failed endotracheal intubation
    - a) Cricothyrotomy kit
    - b) Gum elastic bougie
    - c) Alternative airways
  - 12. Patient-specific dosages of sedating, pretreatment and neuromuscular blocking agents.
- E. PROCEDURE:
  - 1. **Prepare** – team, needed equipment, drugs, emergency equipment.
  - 2. **Pre-Oxygenate**-oxygenate 3-5 minutes on 100% NRB or 3-4 vital capacity breaths or 3-4 breaths using BVM manual ventilation with Sellick maneuver.

3. **Pre-medicate**-administer drugs to minimize side effects of RSI:
  - a) Atropine- 0.02 mg/kg (minimum 0.1 mg). Mandatory for children under age 10 to prevent bradycardia and vagal effects of succinylcholine and to dry secretions.
  - b) Lidocaine 1.5 mg/kg to decrease the effects of laryngoscopy and endotracheal tube placement, especially in patients with head injuries. It may reduce cardiovascular side effects as well.
4. **Induce**
  - a) Administer etomidate 0.3 mg/kg (preferred agent) or;
  - b) For adults, administer 5 mg of morphine sulfate and 5 mg of diazepam or 2 mg of midazolam;
  - c) For children, administer 0.2-0.3 mg/kg morphine sulfate and 0.2 mg/kg midazolam
5. **Paralyze**
  - a) Administer succinylcholine-1.5 mg/kg IVP (2.0 mg/kg in children) unless contraindicated.
  - b) Neuromuscular blocking agents block only neuromuscular function-they do not produce amnesia or analgesia.
6. **Monitor** actions of medications and for intubating conditions.
7. **Intubate**
  - a) Perform endotracheal intubation and confirm tube placement per procedures listed above.
8. **Assess** patient's status before, during and after intubation:
  - a) Assess patient's cardiovascular status, SpO<sub>2</sub> and response to RSI.
  - b) Assess patient's response to medication.
  - c) Monitor patient's cardiovascular status, return of motor function and ability to follow commands.
  - d) Consider the need for ongoing paralysis and sedation with a non depolarizing agent. Do not repeat succinylcholine.
9. **Document**
  - a) Mental status prior to and after procedure.
  - b) Hemodynamic status before, during and after procedure
  - c) Dosages and times of IV medications will be documented in the medical record along with patient's response
  - d) Tube placement including size of tube used, position of tube and confirmation techniques
  - e) Patient's response to procedure
- F. **If not successful:**
  1. Reattempt intubation with the most experienced practitioner. If attempt fails, maintain ventilation, and immediately refer to the **Failed Airway Algorithm**. DO NOT administer additional induction agents or sedatives. DO consider the reversal of sedative agent and neuromuscular blocking agent.

## VI. RETROGRADE INTUBATION

### A. Indications:

1. Same indications as for tracheal intubation: unconsciousness, respiratory distress, or upper airway obstruction.
2. Failure of conventional techniques of tracheal intubation (nasal and oral), including blind tracheal intubation.
3. Bridge from needle cricothyrotomy to intubation.

### B. Equipment:

1. Gloves
2. 10% Povidone-iodine
3. 10 ml syringe.
4. 16 g over the needle IV catheter
5. Seldinger guidewire
6. Locking hemostat
7. Appropriate sized ET tube
8. 4 x 4 gauze dressings

### C. Procedure:

1. Locate cricothyroid membrane.
2. Clean skin over insertion site with 10% Povidone-iodine.
3. Insert the IV catheter, with the syringe attached, through the cricothyroid membrane towards the head into the trachea and aspirate air to insure correct placement.
4. Remove syringe and needle, leaving the catheter in place.
5. Clamp guidewire at neck to prevent it being pulled completely through.
6. Advance guidewire through catheter toward the head into oropharynx.
7. Remove IV catheter.
8. Open patient's mouth, find guidewire and remove it from mouth.
9. Thread an 18 fr. suction catheter (or a NG tube with connector cut off) over wire from mouth end. This stiffens the guidewire.
10. Thread ET tube over wire/catheter assembly and advance into trachea until it stops.
11. Unclamp wire at neck and remove wire/catheter from distal (mouth) end of ET tube.
12. Advance ET tube about 1 cm.
13. Verify correct placement of the ET tube.

### D. Precautions

1. This procedure is slow. It should not be the first choice for the failed airway.

### E. Complications:

1. Bleeding: Apply local pressure to the site until bleeding stops.

2. Infection: Try to maintain sterile technique during needle insertion.

## VII. CRICOTHYROTOMY

- A. This is the procedure of choice when presented with a patient who cannot be ventilated or intubated.
- B. Equipment:
  1. Gloves/mask
  2. Alcohol prep or povidone-iodine solution
  3. 4X4 gauze dressings
  4. Bag-valve-mask
  5. Size 6 ET tube or tracheostomy tube (largest one that will fit)
  6. Syringe (10 ml) to inflate cuff on tube
  7. Scalpel with No. 11 blade
  8. Tracheal hook
  9. Curved hemostats
  10. Tape
- C. Procedure:
  1. Locate the cricothyroid membrane
  2. Cleanse neck skin from chin to chest.
  3. Pull skin away from cartilage and incise from thyroid prominence to cricoid prominence.
  4. Palpate cricothyroid membrane in incision.
  5. Blunt dissect as needed with curved hemostats to access cricothyroid membrane
  6. Affirm proper landmark with palpation.
  7. Make puncture wound through cricothyroid membrane.
  8. Apply hook to inferior thyroid cartilage through incision in membrane.
  9. Use smallest finger or blunt end of scalpel to enlarge opening.
  10. Insert ET tube or tracheotomy tube through opening and inflate cuff.
  11. Ventilate patient and confirm proper tube position.
  12. Secure tube with tape or prussic knot.
- D. Complications:
  1. Bleeding: Be sure to identify your landmarks correctly. If bleeding occurs, use direct pressure.
  2. Inadequate ventilation: Be sure that the tube is inserted in the trachea and that it is in correct position (i.e., not in the right mainstem bronchus). Check position carefully.
  3. Infection: This is a late complication. Try to maintain sterile technique.

VIII. TABLE OF TREATMENT ADJUNCTS:

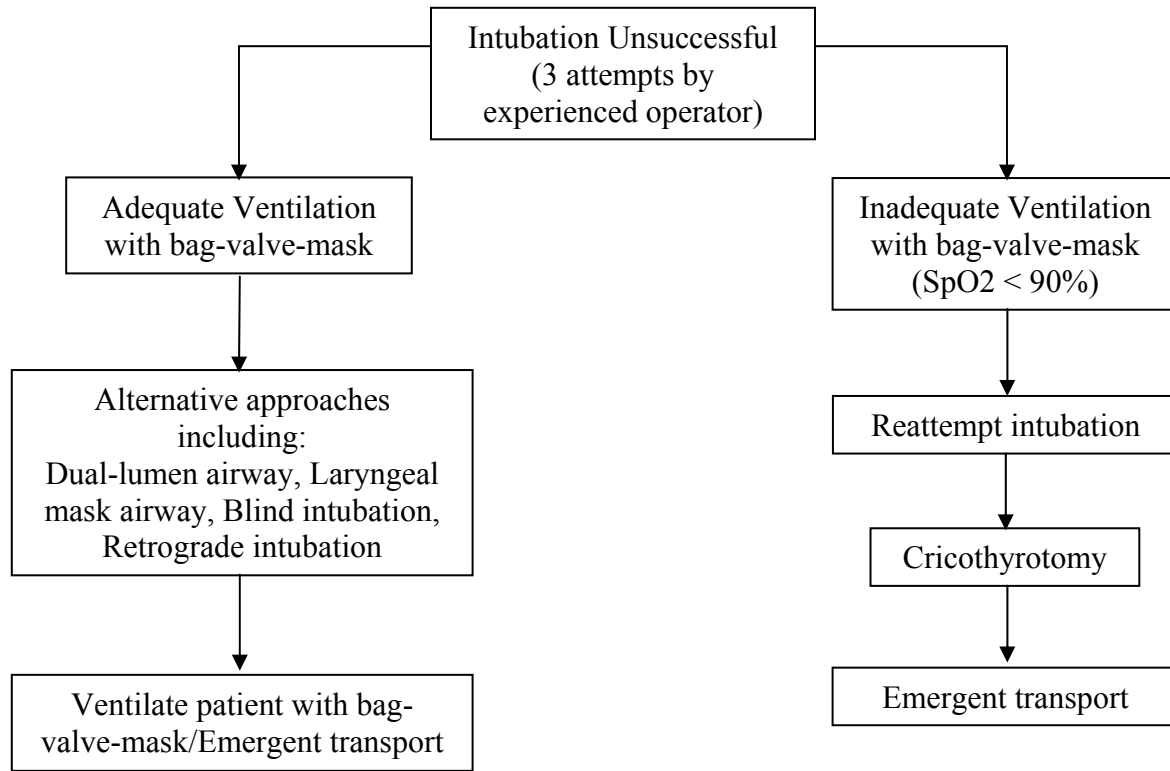
Adjunct	Indications	Contraindications	Comments
Dual Lumen Airway device	Inexperienced provider. Unable to intubate	16 or less Under 5' Intact gag Esophageal disease Caustic ingestion	Difficult to manage if secretions/vomit between cuffs.
Laryngeal Mask Airway	Inexperienced provider. Unable to intubate	Gag Reflex Vomiting	Does not provide complete protection from aspiration.
Orotracheal intubation	Failure of basic maneuvers; provides airway protection	None	Difficult in patients with severe maxillofacial injuries
Nasotracheal Intubation	Conscious intubation, clenched jaw, severely obese	Apnea, facial/head injuries	Must be breathing
Rapid Sequence Intubation	Respiratory failure	Relative to medications	Only by very experienced MICPs
Retrograde intubation	Failure to intubate by viewing or blind Bridge device	None	Time consuming
Surgical Cricothyrotomy	Unable to ventilate Unable to intubate	Able to ventilate by other means	

IX. MEDICATIONS THAT CAN BE ADMINISTERED BY TRACHEA:

Lidocaine
Epinephrine
Atropine
Narcan

## FAILED AIRWAY ALGORITHM

The following algorithm is a modification of the American Society of Anesthesiologist's difficult airway algorithm. It should be followed in cases when the patient cannot be intubated with initial attempts. If successful at one level, there is no need to progress to the next level. The patient should be emergently transported as soon as adequate ventilation is established. If the patient cannot be ventilated adequately at any time, move to the inadequate ventilation section.



## AUTOMATED EXTERNAL DEFIBRILLATION (AED)

### I. GENERAL POINTS:

- A. Automated External Defibrillation has been proven to be an effective treatment for cardiac arrest caused by Ventricular Fibrillation (V-Fib) or Ventricular Tachycardia (V-Tach)
- B. Rapid assessment and application of the AED is essential to favorable patient outcome.

### II. OBJECTIVES:

- A. Protection against the spread of bloodborne pathogens.
- B. Maintenance of ABCs.
- C. Recognition of the need for early defibrillation.
- D. Quick, efficient and safe use of the Automated External Defibrillator (AED) and other appropriate field intervention while waiting for ALS transportation to arrive.

### III. RECOGNITION:

- A. Establish that the patient meets all of the following criteria:
  - 1. Unconscious
  - 2. Apneic
  - 3. Pulseless
  - 4. Greater than 8 years old or 40 Kg or;
  - 5. Meets manufacturer recommendations for pediatric AED pads.

### IV. PROCEDURE:

- A. Move the patient to area that is safe for AED use:
  - 1. Do not use an AED in an explosive atmosphere.
  - 2. Do not use an AED in an excessively wet atmosphere.
- B. **Begin CPR.** (Two rescuer CPR is preferred if it does not delay AED.)
- C. One member will **set up the AED** and ready the patient for its use:
  - 1. Turn the unit ON and follow the voice prompts.
  - 2. Remove any Nitroglycerin paste or patches.
  - 3. Shave any excess hair if necessary for adhesion of the defibrillation pads.
  - 4. Insure that the defibrillation pads are connected to the unit's cables.
- D. **Attach the defibrillation pads** to the patient's chest wall:
  - 1. The sternum pad is to be attached to the patient's upper right chest wall, to the right of the sternum on the mid-clavicular line.
  - 2. The apex pad is to be attached to the patient's lower left rib cage, laterally and beneath the left nipple.
- E. **Press the ANALYZE** button when advised to by the unit's voice prompts:
  - 1. All patient contact must cease while the AED analyzes.

2. This should take approximately 12 - 15 seconds.

- F. **Press the SHOCK button** if advised to by the unit's voice prompts:
1. All members must be clear of contact with the patient before the Shock button is pushed.
  2. The operator of the AED will visually check that all members have ceased patient contact.
  3. The operator of the AED will announce **"I'm clear, you're clear, we're all clear...shocking"** before pressing the Shock button.
- G. After a series of three shocks **check** the patient's **pulse**:
1. If the patient still meets all three of the criteria for AED use perform two rescuer CPR for one minute.
- H. **If the AED unit's voice prompts advise that No Shock is Advised:**
1. Check for a pulse.
  2. Continue CPR for one minute.
  3. Reanalyze after one minute.
- I. **If the patient's pulse returns:**
1. Insure that the patient has a patent airway.
  2. Administer O<sub>2</sub>;
    - a) insert an oropharyngeal airway;
    - b) BVM at 15 - 25 lpm if not breathing adequately
    - c) NRB at 10 - 15 lpm if adequate respirations return.
  3. Reassess the patient every 30 seconds, if resuscitated.
  4. Monitor the patient's condition closely.
- J. **Repeat shocks** in sets of three, followed by one minute of CPR, if the patient remains pulseless.
- K. **Transport** after second set of three shocks unless relieved by ALS personnel.



## ASSISTING WITH MEDICATIONS

### I. GENERAL POINTS

- A. Medications carried and administered by the EMT include O<sub>2</sub>, activated charcoal, and oral glucose.
- B. EMTs may assist administration of medications such as inhalers, nitroglycerin, and epinephrine that have been prescribed by a physician for a patient with a specific diagnosis.
- C. In order for the EMT to assist the patient in taking his or her own medications, the EMT must:
  - 1. Assess patient for signs and symptoms.
  - 2. Insure the medications are the patient's own, prescribed by a physician.
  - 3. Check the 3 R's (Right patient, Right medications, Right dose).
  - 4. ***Consult with medical control*** if not otherwise authorized by a physician's signed standing orders.
  - 5. Take and record vital signs before and after administration.
  - 6. Record time and route the medication was given.
- D. It is the responsibility of the EMT to know and understand the indications, contraindications, and side effects that could occur. If no signed standing orders address assisting with medications, medical control should be consulted "on-line" before administering medications.



## CHEST DECOMPRESSION

### I. GENERAL POINTS

- A. This procedure may be performed by a MICP when indicated.
- B. A tension pneumothorax can occur in any situation in which a simple pneumothorax occurs. This means that it can occur without preceding trauma.
  - 1. If intra-thoracic pressure continues to rise, not only will the person be unable to expand the lung on the involved side, but the pressure exerted on the mediastinum will begin to move it toward the other side, decreasing the volume available to expand the other lung.
  - 2. The rising intrathoracic pressure also compresses the great vessels in the mediastinum and reduces venous return, leading to hypotension and shock.
- C. Chest decompression is a life-saving procedure in cases of tension pneumothorax.

### II. RECOGNITION

- A. Any patient who is at risk for development of a pneumothorax should be carefully assessed, observed, and reassessed for the development of a tension pneumothorax. Below are high risk situations:
  - 1. Any patient receiving positive pressure ventilation, whether or not they are intubated.
  - 2. Any patient with blunt or penetrating chest trauma.
  - 3. Any patient with pre-existing lung disease, such as COPD.
- B. Signs of simple pneumothorax should also be present in any case of tension pneumothorax. Dyspnea (mild to moderate), chest pain, decreased or absent breath sounds on the involved side.
- C. Some or all of the following signs should also be present in tension pneumothorax.
  - 1. Extreme anxiety
  - 2. Increasing dyspnea
  - 3. Absent or diminished lung sounds
  - 4. Distended neck veins
  - 5. Tachycardia / tachypnea
  - 6. Hypotension
  - 7. Hyperresonance
  - 8. Cyanosis
- D. Major trauma victims should have catheter-over-the-needles placed on both sides of the chest with or without one-way valve devices, if all of the following are present:
  - 1. Obvious chest trauma;
  - 2. Patient intubated;

3. Difficulty bagging, tracheal deviation, or absent breath sounds on one or both sides.
- E. All patients who are (or likely to be) experiencing a pneumothorax or tension pneumothorax are to receive 100 percent oxygen via non-rebreather mask or assisted ventilation.

### III. PROCEDURE

- A. In some cases of penetrating chest trauma, placing an occlusive dressing on the wound may convert an open pneumothorax to a closed tension pneumothorax. In these cases, treatment consists of removing the dressing and converting the wound back to an open pneumothorax. This may be the only treatment needed.
- B. The simplest effective way to release a tension pneumothorax is with a large bore (12 - 16 gauge) at least 2" over-the-needle catheter as follows:
  1. In cases where decompression is urgent, especially in those situations where the patient is already intubated, the catheter-over-the-needle may be placed without any one-way or sealing device. This will convert a closed tension pneumothorax into a simple open pneumothorax.
  2. Use the 2nd intercostal space in the mid-clavicular line.
  3. Clean the area thoroughly with alcohol or betadine.
  4. As a general rule, if the patient is alert and stable enough that chest decompression is so painful that the patient becomes combative (and has enough strength to make things difficult for you), the patient's condition is probably not precarious enough to warrant decompression in the field. Even in those patients who do require decompression, insertion of the needle may elicit some reaction. Where the need is clear, do not stop because of this pain reaction.
  5. Hold the needle perpendicular to the skin at the insertion site and at the top edge of the rib. Insert straight in, riding along the upper edge of the third rib. (The intercostal artery and vein runs along the inside of the lower edge of the rib, so always insert the needle along the upper edge to avoid bleeding.) It may be helpful to "walk" the tip of the needle up along the top of the rib and over.
  6. In tension pneumothorax, air under pressure should be released when the needle enters the pleural cavity. This will be heard as a rush of air through an open catheter-over-the-needle. If you are using a syringe attached to the catheter-over-the-needle you should be able to withdraw air by pulling out on the barrel of the syringe.
  7. Once the presence of a tension pneumothorax has been confirmed. Remove the needle, leaving the catheter in place. Tape the catheter in place. Observe all Murphy's Law precautions ("if it can come out, it will").

#### IV. CAUTIONS

- A. Chest decompression is for life-threatening situations. If the patient is not in significant respiratory distress and is otherwise stable, **do not** perform chest decompression.
- B. Chest decompression can cause the following complications:
  - 1. Creation of a pneumothorax in those cases where none existed previously (avoided by correct diagnosis).
  - 2. Bleeding from laceration of intercostal vessel (avoided by placement along top edge of rib).
  - 3. Lung laceration (avoided by correct diagnosis and removal of needle after correct placement).



# GASTRIC INTUBATION

## I. GENERAL POINTS

- A. Placement of a gastric tube is indicated several times throughout this document. It is generally a prolonged transport consideration.
- B. This procedure is authorized for MICP with appropriate signed physician orders.
- C. A gastric tube should be considered anytime gastric distension is anticipated or discovered.
- D. The nasal route is generally preferred unless contraindicated. The oral route may be used when the patient is intubated or the nasal route is contraindicated.

## II. CONTRAINDICATIONS

- A. Nasal
  - 1. Basilar skull fracture
  - 2. Known bleeding disorder
  - 3. Obstruction
  - 4. Esophageal varicies-relative
  - 5. Caustic ingestion-relative
- B. Oral
  - 1. Non-intubated patient with gag reflex
  - 2. Esophageal varicies-relative
  - 3. Caustic ingestion-relative

## III. EQUIPMENT

- A. PPE (gloves, gown, mask)
- B. Nasogastric (NG) tube
- C. 60 ml syringe with catheter tip
- D. Water-soluble lubricant
- E. Lidocaine jelly or topical anesthetic spray
- F. Tape
- G. Stethoscope

## IV. PROCEDURE

- A. Listed below is the procedure for nasogastric placement. Adjust accordingly if orogastric route is used.
- B. Obtain consent and reassure patient.
- C. Measure tube from nose to ear and from ear to xiphoid.
- D. Sit patient upright if conscious.
- E. Lubricate distal end of tube.
  - 1. May lubricate with lidocaine jelly.

2. May spray nasopharynx with topical anesthetic.
  - F. Advance tube along floor of nose.
  - G. Resistance will be felt and the patient may gag as the tube enters hypopharynx.
  - H. Encourage the patient to swallow.
  - I. Continue insertion until measured length has been inserted.
  - J. If they can, ask patient to speak. If they cannot speak and could previously, the tube is in the trachea. Withdraw it immediately. Continue if the patient can speak.
  - K. Instill 30 ml of air into tube while listening over epigastrium. You should hear gurgling. If not advance tube and recheck.
  - L. Aspirate about 30 ml stomach contents with syringe. There should be some noted. If not, and if unable to hear epigastric sounds, withdraw tube and reattempt.
  - M. Secure tube to nose with tape.
  - N. Evacuate stomach contents as ordered by medical control.
- V. COMPLICATIONS
- A. Improper placement. Avoid by following procedure above to confirm tube placement. Remove if unsure.
  - B. Epistaxis. Avoid by using plenty of lubricant and using gentle technique.
  - C. Vomiting. Avoid by having patient swallow repeatedly.

# FOLEY CATHETER INSERTION

## I. GENERAL POINTS

- A. There are two types of urinary catheters:
  - 1. An indwelling catheter that is inserted and left in place to provide continuous urine drainage. Indwelling catheters are equipped with a balloon to keep the catheter in place.
  - 2. A straight-catheter that is inserted to obtain a sterile sample and is removed after the sample is obtained. Straight catheters are not equipped with a balloon. This type is generally not used in prehospital medicine.
- B. Paramedics are authorized to perform this procedure acting under medical direction while following appropriate protocols in this general document.

## II. INDICATIONS

- A. In the field setting a foley catheter may be inserted when ordered by medical control.

## III. EQUIPMENT

- A. PPE (gloves, gown, mask)
- B. Foley insertion kit (contains sterile gloves, drapes, betadine, lubricant, plastic forceps, cotton balls, # 16 French foley catheter, 10 ml saline-filled syringe)
- C. Urinary drainage bag
- D. Tape

## IV. PROCEDURE:

- A. Urinary catheters are inserted using sterile technique.
- B. Wash hands and assemble equipment.
- C. Explain the procedure to the patient and provide privacy.
- D. Ensure adequate lighting.
- E. Position patient
  - 1. Female patient: position on back with knees flexed and separated (frog-leg position), with feet flat on the cart (you may need assistance to help the patient maintain this position or to direct the light).
  - 2. Male patients: position on back with legs out straight and flat on the cart.
- F. Open catheter kit (to maintain sterility of kit, place between patient's legs (female patient), next to patient's hip (male patient))
- G. Place underpad beneath buttocks (female), on abdomen-thighs (male)
- H. Put on sterile gloves and other personal protective equipment as indicated
- I. Pour betadine solution over cotton balls
- J. Open lubricant and squeeze contents onto tray
- K. Test balloon of catheter: inject fluid through catheter and observe integrity of balloon, withdraw solution and replace syringe on sterile field

L. Female patient:

1. Separate the labia as widely as possible with the thumb, middle, and index finger of non-dominant hand so you have a full view of the urinary meatus.
2. Keep the labia well separated throughout the procedure (so your view of the meatus is not obstructed and the area is not re-contaminated once it's been cleaned).
3. With your dominant hand, pick up a sterile cotton ball with the plastic forceps and wipe one side of the urinary meatus with a single downward motion.
4. Discard cotton ball.
5. Wipe the other side of the urinary meatus in the same way with another cotton ball and discard.
6. Wipe directly over the meatus with a third cotton ball.
7. Lubricate catheter.
8. Insert catheter tip into meatus and advance about 2-3 inches into bladder until urine begins to flow.
9. Advance catheter an additional 1-2 inches and inflate balloon.
10. Pull gently on catheter to make sure balloon is inflated and catheter remains in place.
11. Attach catheter to urine drainage bag.
12. Document procedure (type/size catheter inserted, amount/color of urine obtained).

M. Male patient:

1. Hold penis with non-dominant hand.
2. If patient is uncircumcised, retract the foreskin with finger and thumb.
3. Gently lift and stretch the penis to a 60-90° angle and maintain this position throughout the procedure to straighten the urethra and maintain a sterile field.
4. With your dominant hand, pick up a sterile cotton ball with the plastic forceps and wipe the urinary meatus with a single downward motion.
5. Discard cotton ball.
6. Wipe the head of the penis with remaining cotton balls using a circular motion and discard.
7. Lubricate catheter.
8. Insert catheter tip into meatus and advance about 6-8 inches into bladder until urine begins to flow.
9. Advance catheter an additional 1-2 inches and inflate balloon.
10. Pull gently on catheter to make sure balloon is inflated and catheter remains in place.
11. Attach catheter to urine drainage bag.
12. Document procedure.

N. Tips for insertion:

1. Do not force a catheter during insertion.

2. Do not inflate the balloon of an indwelling catheter without first seeing urine flow.
3. Female patients: if the catheter is inserted into the wrong opening, leave it in place and obtain a new sterile catheter to try the insertion again. Remove misplaced catheter after correct insertion.
4. Male patient: if you meet resistance to the passage of the catheter, do not totally remove the catheter, withdraw the catheter slightly, reposition the penis at a 90° angle and attempt to insert again (older male patients may have enlargement of the prostate gland which interferes with catheter insertion).
5. Hang the urinary drainage bag below the level of the bladder (helps gravity drainage).

V. COMPLICATIONS:

- A. Urinary tract infection can result from the introduction of bacteria into the bladder-maintain sterile technique during procedure
- B. Improper insertion can cause traumatic injury to the urethral and bladder mucosa.
  1. Lubricate catheter prior to insertion.
  2. If inserting an indwelling/retention catheter, advance the catheter 1-2 inches farther once urine flow is obtained before inflating balloon.
  3. Do not continue to inflate balloon if you meet resistance.

# INTRAOSSEOUS ACCESS

## I. GENERAL POINTS

- A. The bone marrow provides a vascular access route that is as good as a peripheral IV, but remains easy to find and enter in states of circulatory collapse. It is supplied by a rich vasculature and medication time to central circulation by the IO route is comparable with intravenous access.
- B. A young child's bone is soft and porous, so placing the needle is easy.
- C. Mechanical devices are available that allow insertion into an adult's bone. The manufacturer's instructions should be followed for insertion of these devices.

## II. INDICATIONS

- A. If peripheral IV access is not quickly obtained, an intraosseous line should be placed. Possible situations include:
  - 1. Cardiopulmonary arrest
  - 2. Decompensated shock from dehydration, sepsis or hemorrhage (hypotension, absent pulses, unresponsive.)
  - 3. IO access should be considered early when needed. If the patient is peripherally vasoconstricted, IO may be attempted before IV access. When considered, do not necessarily wait for IV access to fail before attempting IO access.
- B. Use only in patients who have a decreased pain response. Do not use if patient is awake, because it is a very painful procedure.
- C. Contraindications:
  - 1. Gross infection at the intended insertion site.
  - 2. Newly fractured bone (or suspicion of fracture) at the intended site.
  - 3. Osteogenesis imperfecta (a congenital bone disease in which the bones fracture very easily).

## III. SITES

- A. Pediatric:
  - 1. Proximal tibia (preferred site): Two finger-widths below the tibial tuberosity on the anteromedial (flat) surface.
  - 2. Distal Femur (use only in children <3 years): Two finger-widths above the top of the patella in the anterior midline.
  - 3. Medial Malleolus: Two finger widths above the medial malleolus.
  - 4. Sites are away from the ends of the bone to avoid damage to the growth plate.
- B. Adult:
  - 1. Iliac crest
  - 2. Sternum

## IV. PROCEDURE

A. Pediatric Insertion

1. Locate insertion site. Cleanse with alcohol or Betadine.
2. Adjust the depth guard on the needle (in an infant, cover at least half of the needle length).
3. Insert the needle perpendicular to the skin surface, and advance until it touches bone.
4. Penetrate the bony cortex with firm pressure and a rotary ("screwdriver") motion. A "pop" and sudden lack of resistance signal entry into the marrow cavity.
5. Remove the stylet, and check the position by injecting saline
6. Attach IV setup.
7. The IV may not flow as freely as it does in a vein and pressure infusion may be required.
8. Lower the depth guard until it is against the skin and tape in place. Tape IV tubing to the leg to avoid accidental dislodging.
9. If resistance increases significantly during infusion, oozing appears at the insertion site, or there is swelling or discoloration of the leg, discontinue the line.
10. If another IO is started, it must be done in a different bone, because the hole in the bony cortex does not close immediately.

B. Infusion

1. You can infuse any fluid or medication that can go through a peripheral IV.
2. For pediatric IO:
  - a) Attach flushed IV extension tubing connected to three way stopcock connected to IV administration set.
  - b) If a fluid bolus is needed, "Pull-push" syringe method (three-way stopcock) is the recommended procedure for children.
3. Adequate flow rates for IV boluses can be accomplished if the fluid is under pressure.

V. COMPLICATIONS

- A. Complications are rare.
- B. Local infection may occur. Osteomyelitis is very rare.
- C. Fluid or medications may leak into surrounding tissue.
- D. Abnormal growth of the bone is unlikely if the growth plate is avoided.
- E. Fat embolism non-existent in infants. Risk increases with age.



## INTRAVENOUS ACCESS

### I. GENERAL POINTS

- A. Throughout this document, there are standing orders to start an IV. Normal Saline (0.9%) is the fluid of choice for prehospital IV infusions. Ringer's Lactate solution may be considered for hemorrhagic shock.
- B. A saline lock may be substituted for an infusion when there is no immediate need for administration of IV fluids or medications.
- C. Providers should attempt to place the IV catheter as distal as possible. The first attempt should not be in the antecubital vein. Start at the hands and work your way up. Try to place the cannula in the non-dominant arm. Avoid placing the cannula in a vein over a joint as the flow is often compromised when using these sites.
- D. If no IV sites are available in the upper extremities, the legs and feet may be used if there is an urgent need for IV fluids or medications.
- E. IV's may be started through burned tissue if needed.
- F. In trauma situations, the IV should be started en route in a moving ambulance. It is inappropriate to delay transport to start an IV in trauma.
- G. If IV access cannot be obtained after two attempts by the same provider, further attempts should be made by the most experienced provider. Generally limit attempts to three.
- H. A MICP may use the external jugular for IV access. This is considered a peripheral IV.

### II. EQUIPMENT

- A. Gloves
- B. Tape
- C. Selection of over the needle IV catheters
- D. Alcohol prep
- E. Saline lock adapter
- F. Selection of syringes
- G. Selection of needles or needleless adapters
- H. Selection of IV fluids
- I. Selection of IV administration sets
- J. Blood tubes
- K. Gauze pads

### III. PROCEDURE

- A. Obtain consent and reassure patient.
- B. Select appropriate catheter. The appropriate catheter is generally the largest bore, shortest diameter that will fit in the vein selected.
- C. If a saline lock is to be started, flush the adapter with NS.

- D. Follow the procedures below for infusions.
  - 1. Select proper fluid and check expiration date, clarity, color.
  - 2. Select proper administration set
    - a) 10 gtt/ml if volume infusion is anticipated
    - b) 60 gtt/ml for TKO or medication administration only
    - c) Manufacturer's tubing for IV pump
  - 3. Connect IV tubing to the IV bag
  - 4. Prepare administration set-fill drip chamber and flush tubing
- E. Cut or tear tape
- F. Take infection control precautions
- G. Apply tourniquet
- H. Palpate suitable vein. Start low and work up the arms.
- I. Cleanse site
- J. Stretch skin over IV site
- K. Insert needle at about 30° angle to skin with bevel up.
- L. Advance needle into vein (feel pop at this time).
- M. Note flashback
- N. Lower angle of needle and advance an additional 1/8 inch.
- O. Thread catheter off needle into vein. Do not remove needle until the catheter has been advanced all of the way into the vein.
- P. Remove needle
- Q. Dispose of needle in sharps container. Do not stick in mattress or seat cushion.
- R. Occlude vein proximal to catheter
- S. Draw blood into 30 ml syringe or use Vacutainer adapter and fill tubes directly.
- T. Connect IV tubing or saline lock to catheter
- U. Release tourniquet
- V. Run IV for a brief period or flush saline lock with 2 ml NS to assure patent line
- W. Secure catheter and tubing with tape
- X. Adjust flow rate as appropriate
- Y. If syringe was used to draw blood, attach needle and fill blood tubes. Dispose of syringe/needle in sharps container.

#### IV. COMPLICATIONS

- A. Infiltrated IV. Swelling and pain will be noted at site when fluid is infused. Remove the catheter and apply direct pressure.
- B. Hematoma. Swelling and discoloration will be noted at site without administration of fluid. Remove catheter and apply direct pressure.
- C. Catheter shear. Avoid by never advancing and withdrawing catheter over needle.
- D. Air embolism. Flush tubing and ensure no air in line to avoid this complication

## INJECTED MEDICATION ADMINISTRATION

### I. GENERAL POINTS

- A. This protocol is to be followed by EMT-2, EMT-3 and MICP providers when administering medications indicated throughout this document.
- B. Once a medication has been administered, it cannot be taken back. Be sure that you have checked for allergies, use the right medication, the right dose, by the right route, and give it to the right patient over the right time.
- C. It is the responsibility of the provider to know and understand the actions, indications, contraindications, dosages, administration rates, and side effects that could occur. If unsure, consult on-line medical control before administration.

### II. PREPARE DOSE

- A. Take BSI precautions.
- B. Assure medication is indicated for the patient.
- C. Assemble necessary equipment.
- D. Select appropriate medication.
- E. Contact medical direction for authorization, if administration is not covered in standing orders.
- F. Determine patient is not allergic to medication.
- G. Check medication for expiration date.
- H. Assure correct concentration of drug
- I. Preloaded syringes
  - 1. Assemble prefilled syringe and expel air
  - 2. Some preload systems require the needle cover be removed before air can be expelled.
- J. Vial packaged medication
  - 1. Cleanse top with alcohol prep if already open
  - 2. Use syringe size that allows filling with more than the dose so that dose will be correct when air is expelled.
  - 3. Inject same amount of air into vial as fluid to be drawn out.
  - 4. Draw up dose plus an additional 10 %
  - 5. Expel air from syringe and set to desired dose
- K. Ampule packaged medication
  - 1. Tap side of ampule to move all medication to bottom.
  - 2. Wrap ampule in gauze and break off top of ampoule.
  - 3. Attach a filter needle to the syringe.
  - 4. Draw up desired dose plus 10 %.
  - 5. Remove filter needle and dispose in sharps container.
  - 6. Attach appropriate needle or needleless adapter to syringe.

7. Expel air from syringe and set to desired dose

### III. SUBCUTANEOUS ADMINISTRATION (SQ)

- A. Select 25g  $\frac{1}{2}$  or  $\frac{5}{8}$ " needle and 1 ml syringe.
- B. Identify injection site.
- C. Cleanse puncture site using aseptic technique.
- D. Elevate SQ tissue by pinching skin.
- E. Insert needle at 45° angle in one quick motion.
- F. Aspirate for blood return.
  1. If no blood return, smoothly and gently inject medication.
  2. If blood returns, withdraw needle, discard, and start over at another site.
- G. Withdraw needle and dispose in appropriate container.
- H. Massage site.

### IV. INTRAMUSCULAR ADMINISTRATION (IM)

- A. Select 19-21g  $1\frac{1}{2}$ " needle and up to 5 ml syringe.
- B. Identify injection site.
- C. Cleanse puncture site using aseptic technique.
- D. Hold skin taut at injection site.
- E. Insert needle at 90° angle in one quick motion.
- F. Aspirate for blood return.
  1. If no blood return, smoothly and gently inject medication.
  2. If blood returns, withdraw needle, discard, and start over at another site.
- G. Withdraw needle and dispose in appropriate container.

### V. IV BOLUS ADMINISTRATION

- A. Cleanse injection site with alcohol prep.
- B. Reaffirm correct medication and dose.
- C. Stop IV flow.
- D. Administer correct dose at proper push rate
- E. Flush tubing by opening flow regulator. Some medications such as adenosine must be flushed with a 20 ml bolus. Opening the flow regulator will not suffice.
- F. Adjust drip rate to that previously ordered.
- G. Dispose of syringe and needle in sharps container.
- H. Observe patient for desired effect/adverse side

### VI. IV INFUSION ADMINISTRATION

- A. Reconfirm allergies
- B. Check IV fluid for expiration date, proper fluid, clarity
- C. Check medication for expiration date, clarity, concentration

- D. Inject correct amount of medication into IV solution
- E. Connect appropriate administration set (10 gtt/ml, pump tubing or 60 gtt/ml) to medication solution
- F. Prepare administration set (fill drip chamber and flush tubing)
- G. Attach needle or needleless adapter to administration set
- H. Continue infection control precautions
- I. Clean port of primary line
- J. Insert needle into port without contamination
- K. Adjust flow rate of secondary line as required
- L. Stop flow of primary line
- M. Secure needle or adapter
- N. Observe patient for desired effect/adverse side effects
- O. Label medication/fluid bag



## PNEUMATIC ANTI SHOCK GARMENT (P.A.S.G) GUIDELINES

### I. INDICATIONS

- A. Pelvic or multiple leg fractures. If patient is normotensive, inflate only until fractures are immobilized
- B. Controllable hemorrhage with signs of shock (rapid, weak pulse, pale, clammy skin, altered level of consciousness, low blood pressure, etc.)

### II. CONTRAINDICATIONS

- A. Pulmonary edema.
- B. **DO NOT** inflate abdominal section if the patients is obviously pregnant, has protruding bowels or an impaled object in the abdominal area.
- C. Known diaphragmatic rupture.
- D. Uncontrolled hemorrhage outside the confines of the garment, e.g. thorax and abdomen.

### III. PROCEDURE

- A. Before application, remove shoes, belt, and pants if time and patient care permits. If you are not able to remove the patient's clothing, empty the patient's pockets.
- B. Inflate leg sections until easily dented with finger or until systolic blood pressure is 90 mmHg
- C. Recheck blood pressure
- D. If systolic blood pressure is less than 90 mmHg, inflate the abdominal section until easily dented with finger or systolic blood pressure in 90 mmHg.
- E. Recheck blood pressure
- F. If further pressure is needed, inflate the legs and then the abdominal section until one of the following occurs:
  - 1. patient's blood pressure is 90 mmHg
  - 2. pop off valves release
  - 3. velcro fasteners begin to slip

### IV. SPECIAL POINTS

- A. The PASG should be inflated on the basis of the patient's blood pressure and not the pressure within the suit
- B. **DO NOT DEFLATE the PASG in the field except in the patient in cardiogenic shock who develops pulmonary edema and/or worsening vital signs.** In this case, seek advice from medical control.
- C. Be alert for pressure changes caused by altitude and temperature variations.



## PULSE OXIMETRY

### I. GENERAL POINTS

- A. This protocol is meant to direct the use of the pulse oximeter in the emergency prehospital care setting. This protocol should be modified appropriately for each manufacturer's pulse oximeter.
- B. Pulse oximetry in the field can help determine the O<sub>2</sub> saturation in the medical or trauma patient who has a potential of becoming hypoxic. The O<sub>2</sub> saturation reading can assist in determining the O<sub>2</sub> adjunct to be applied and the liter flow to be administered or if the patient needs to have assisted ventilation.

### II. OBJECTIVES

- A. Early recognition of acute hypoxemia.
- B. Early and accurate administration of O<sub>2</sub> to patients with moderate or low O<sub>2</sub> saturation (SpO<sub>2</sub>).

### III. INDICATIONS

- A. All patients who require vital signs to be taken should have O<sub>2</sub> saturation measured and recorded as part of the vital signs.
- B. Measure O<sub>2</sub> saturation before applying O<sub>2</sub>, and repeat the measurement after O<sub>2</sub> has been applied. **DO NOT DELAY ADMINISTERING OXYGEN** in situations where it is urgently and clearly indicated just to measure O<sub>2</sub> saturation first.
- C. Continuous pulse oximetry should be used in the following situations:
  - 1. All cases of respiratory distress.
  - 2. Treatment of respiratory or cardiac disease.
  - 3. All cases of altered or depressed level of consciousness.
  - 4. Drug overdoses.
  - 5. Any patient requiring intubation.
  - 6. Major Trauma.

### IV. PROCEDURE

- A. After it is confirmed that the unit is in good operating condition, place the finger slip on the patient's finger. Make sure that all dirt and nail polish or any obstructive covering is removed to prevent the unit from giving a false reading.
- B. Other types of sensors should be applied according to manufacturer's instructions.
- C. When the above steps are completed, the unit will show a number reflecting the O<sub>2</sub> saturation (SpO<sub>2</sub>) and patient's heart rate.

V. CAUTIONS

- A. Pulse oximetry measurements are unreliable in cardiac arrest, hypothermia, carbon monoxide poisoning, and any time the peripheral blood flow is reduced.
- B. Never withhold O<sub>2</sub> from a patient who displays signs and symptoms of hypoxemia even if the SpO<sub>2</sub> is high.

VI. TREATMENT GUIDELINES

- A. For persons with underlying respiratory disease, titrate oxygen to maintain a normal saturation for that individual.
- B. For persons without respiratory disease at sea level:

SpO <sub>2</sub> READING	INTERPRETATION	ACTION
100% TO 95%	Ideal Range	Oxygen therapy as indicated by patient signs and symptoms, mechanism of injury or nature of illness
95% TO 90%	Mild to Moderate Hypoxemia	Oxygen therapy as indicated by patient signs and symptoms, mechanism of injury or nature of illness
90% TO 85%	Severe Hypoxemia	Check airway, start aggressive O <sub>2</sub> therapy, high flow O <sub>2</sub> via nonrebreather mask @ 15 lpm Consider bag valve mask ventilation with 100% O <sub>2</sub>
85% OR LESS	Respiratory Failure	Prepare to intubate or assist ventilations with 100% O <sub>2</sub> and bag-valve-mask

# RESTRAINT

## I. GENERAL ORDERS

- A. Alaska Statute 11.81.430 describes the emergency use of justifiable force by EMS. Reasonable force is justified if:
  - 1. You have consent from a person entrusted with the care of the patient (parent or guardian), or
  - 2. it is an emergency situation, and the force is reasonable to safeguard the patient's welfare.
  - 3. Reasonable force is the necessary, appropriate and non-lethal force to keep the patient from injuring him/herself or others. Factors include:
    - a) Patient's size and strength
    - b) Type of abnormal behavior
    - c) gender and age of patient
    - d) mental state of patient
    - e) method of restraint
- B. Reasonable force may be used to defend against attacks by patients.
- C. Avoid actions that may cause injury to the patient or responders.
- D. Remain vigilant, even after the patient has calmed down.
- E. Seek medical direction for restraints.
- F. If the situation becomes dangerous, **BACK OUT**, and call for additional help.

## II. INDICATIONS

- A. Only restrain a patient if:
  - 1. the patient is a danger to self or others, and
  - 2. won't cooperate with treatment, and
  - 3. you have received approval from medical control, and
  - 4. the situation can be handled safely.

## III. MANAGEMENT

- A. Recommended options for restraint materials:
  - 1. rolled gauze bandages
  - 2. leather restraints
  - 3. local supplies
  - 4. defer to Law Enforcement
- B. Do not use:
  - 1. duct tape
  - 2. rope
  - 3. ace bandages
  - 4. belts

5. backboard straps, used alone
  6. mace or pepper spray
  7. weapons
- C. Have law enforcement on scene.
- D. Use a 4-person team with a leader experienced in restraint procedures.
- E. Develop a plan:
1. Size up the patient (size and condition).
  2. A leader assigns responsibility to each team member; team should act quickly and together to accomplish restraint.
  3. Physical preparation:
    - a) remove pens, jewelry, or anything that could be used to cause injury to yourself or the patient
    - b) review the area for obstacles
    - c) approach the patient in a position that leaves the patient a perceived escape route
  4. One team member should talk to the patient throughout the procedure.
  5. Don't lean into the patient where they can grab hair or clothing.
  6. Avoid unnecessary force; use only the force needed for restraint
- F. "Taking down" patient, positioning patient and securing restraints:
1. Approach patient, control arms and legs,
  2. Place supine on backboard.
  3. Tie restraints to the backboard to avoid upward slippage.
  4. Secure backboard to stretcher with straps.
  5. Cover mouth with surgical or oxygen mask if patient is spitting.
  6. Do not tie off restraints in a knot.
  7. Do not tie off restraints to the stretcher.
  8. Do not restrict breathing with body weight or restraints.
- G. Consider chemical restraint after the patient is under physical control.

#### IV. ASSESSMENT

- A. Keep airway open and watch for breathing difficulties.
- B. Monitor patient.
- C. Pad boney areas on patient.
- D. Assess circulation distal to restraining devices.

#### V. RISK MANAGEMENT

- A. Document incident and restraint techniques.
- B. Document behavior by the patient.
- C. Have witnesses in attendance, especially during transport.

- D. Conduct restraint procedures under medical direction and with police involvement.

## VI. CAUTIONS

- A. Do not remove restraints if the patient bargains or becomes calm.
- B. Remove restraints only under direction from medical control.



## SPINAL IMMOBILIZATION

### I. GENERAL POINTS:

- A. This protocol is intended to provide the out-of-hospital provider with an approach to spinal immobilization.
- B. Full spinal immobilization as a automatic response to trauma has come under scrutiny recently and may not always be in the patient's best interest.
- C. Traditional approaches have relied on mechanism of injury as interpreted by the individual practitioner. This "gut instinct" has resulted in many patients being immobilized as a risk management measure while leaving others not immobilized based on a "minor" mechanism that may indeed have been severe enough to cause injury.
- D. The approach to the assessment of patients with suspected cervical spine injury has been profoundly affected by the publication of the National Emergency X-Radiography Utilization Study (NEXUS) in 2000<sup>1</sup>. This study defined clinical parameters (decision instrument) which can be used to eliminate the need for x-rays of the cervical spine and therefore the need for immobilization in selected patients. The decision instrument required patients to meet five criteria in order to be classified as having a low probability of injury: no midline cervical tenderness, not focal neurologic deficit, normal alertness, no intoxication, and no painful, distracting injury. Of 34,069 patients with possible neck injuries, 818 had cervical spine fractures or spinal cord injury without radiologic abnormalities (SCIWORA). Only two patients classified by the criteria as unlikely to have an injury had a clinically significant cervical spine injury and only one of the two underwent surgery.

### II. THE SPINAL ASSESSMENT TOOL<sup>2</sup>:

- A. An assessment should be performed to determine if a victim of blunt trauma requires spinal immobilization.

#### 1. Mechanism of Injury

Elements in the patient's history that should increase suspicion for spine injury include axial loading (diving), blunt trauma to the head or neck, a motor vehicle crash (automobile, snow machine, ATV etc.), a fall over three feet, and an adult who falls from a standing height. This mechanism does not require a collar and long board; rather, the mechanism should serve to alert medical providers to the need for spine injury screening. Some patients may be predisposed to spinal injury; people with conditions like arthritis of the spine, including ankylosing spondylitis, may have spinal injuries after minor trauma.

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<sup>1</sup> Hoffman, J.R. et al (2000) Validity of a set of clinical criteria to rule out injury to the cervical spine in patients with blunt trauma. *New England Journal of Medicine*, 343, (2), 94-99.

<sup>2</sup> Based on the Maine EMS Spinal Assessment Protocol (2002).

**2. Patient Reliability**

The cervical spine can be clinically cleared only if the patient is alert, calm, cooperative, and not intoxicated. If there is a communication barrier, including poor communications skills (as in young children) or a language barrier, the patient cannot be properly assessed and the c-spine cannot be cleared.

**3. Distracting Injury**

Any painful injury might distract the patient from the pain of a cervical spine injury. This is usually a long bone fracture but could be any fracture, skin injury, or internal injury. Both medical as well as traumatic causes for pain can be considered a distracting injury (e.g. the patient with chest pain who crashes his car while driving to the hospital). If the patient has an injury that seems to be causing enough pain to provide a distraction, the cervical spine cannot be cleared clinically.

**4. Neurologic Evaluation (Abnormal Motor/Sensory Exam)**

A patient who is reliable and has no distracting injury should then be checked for any neurologic deficits using a careful neurologic examination. Abnormal findings including loss of urethral or rectal sphincter tone should prompt providers to proceed with spinal immobilization.

**5. Complaints of Pain or Examination Tenderness**

If a patient complains of pain anywhere in the spine, he or she must be treated as though a spinal injury has occurred. The NEXUS study was only looking at tenderness on examination, particular midline tenderness to palpation, but this change is meant to add a level of concern for spine injury.

While the NEXUS examination applies only to the cervical spine, any complaint of pain in the neck or back, or tenderness to palpation along any part of the spine should be considered an indication that the patient requires full spinal immobilization.

**III. ASSESSMENT:**

- A. In determining whether the above criteria for immobilization are met, the EMT shall perform the following examination. The assessment may be modified to avoid injured areas. For example, a patient with an ankle injury may be asked to move only the great toe.
- B. Subjective assessment
  - 1. Does the patient have any mechanism of injury that may indicate a potential spine injury?
  - 2. Assess for reliable mental status. If any abnormalities are found, the patient should be classified as unreliable for the purposes of this protocol. Over time, the mental status may change and a previously unreliable patient may become reliable.
    - a) Assess level of consciousness.

- b) Determine recent drug or alcohol use.
  - c) Assess for the presence of acute stress reaction.
    - (1) *Ensure the patient is alert, calm, and cooperative.*
- 3. Evaluate for other injury/ies that is/are so painful the patient may be distracted from awareness of neck pain.
- 4. Determine if the patient has pain over the spine. Palpate the entire spine. If pain is elicited from palpation, immobilize.
- 5. Ask the patient about sensations of numbness, tingling, shooting pain, or motor weakness in any extremity. Some components of the sensory examination are subjective. When in doubt, immobilize.
- C. Neurologic Examination: perform the following assessments bilaterally in the upper and lower extremities. Responses should be symmetrical. Any abnormalities should prompt spinal immobilization.
  - 1. Motor:
    - a) Have the patient spread the fingers of his or her hand and resist as you try to squeeze them together. There should be some resistance as you squeeze.
    - b) Ask the patient to hold his or her hand out in front of them with the palm facing down. While supporting the wrist, ask the patient to resist while you push down on the dorsal surface of the hand or fingers. The patient should be able to provide some resistance.
    - c) “Gas pedal test”-Place your hand on the bottom of the patient’s foot at the great toe. Ask the patient to push down against resistance. The patient should be able to apply pressure to your hand.
    - d) Move your hand to the top of the foot and ask the patient to pull their toe towards their nose against your resistance. The patient should be able to apply pressure to your hand.
    - e) Sensory: assess for the ability to distinguish soft and sharp sensation in each hand and foot. Use a sharp object and a soft object. A corner of a gauze pad and a pencil may be used. Another option is to break a wooden shaft cotton-tipped applicator. Do not puncture the skin. The sensory exam should be considered positive if the patient complains of distal paresthesias/dysesthesias (abnormal sensations e.g. tingling, or painful sensations) even if they are able to “feel” their extremities.
      - (1) *Alternately apply the soft and then the sharp object to each extremity. Do not let the patient know which one was used. Ask the patient whether the sensation is soft or sharp. Repeat soft and sharp in all extremities.*
      - (2) *The patient should be able to distinguish soft and sharp.*

#### IV. DOCUMENTATION:

- A. In any case where there is head injury, facial injury, or a mechanism of injury suggesting the possibility of a cervical spine injury, **documentation to support the decision not to provide cervical immobilization under this protocol is absolutely essential.** This documentation must include the following information:
1. Subjective:
    - a) The examination was performed on a reliable patient.
    - b) The patient denies having any spinal pain.
    - c) The patient denies having any extremity weakness or loss of movement.
    - d) The patient denies having any tingling or feeling of pins and needles in the extremities.
  2. Objective:
    - a) There is no pain on palpation of the spine.
    - b) Motor function is intact in all of the extremities.
    - c) Sensation is intact in all extremities.

V. CAUTIONS:

- A. Use of a backboard for stabilization of some other injury than the spine, or to move the patient does not mean that spinal immobilization is indicated.
- B. Use of cervical immobilization in adults should always be followed with long board immobilization. Do not immobilize the head without immobilizing the body (it can cause torsion on the neck).
- C. Spinal immobilization with a cervical collar and a vacuum mattress is a recommended technique. Vacuum mattress is preferred for all but short transports.
- D. Spinal immobilization should not be used solely because of the mechanism of injury or associated injuries. Mechanism of injury should be considered along with physical examination findings when determining whether to immobilize a patient.

# REFERENCE



## CELSIUS TO FARENHEIT CONVERSIONS

Celsius	Fahrenheit
44.0	111.2
43.0	109.4
42.0	107.6
41.0	105.8
40.0	104.0
39.0	102.2
38.0	100.4
37.0	98.6
36.0	96.8
35.0	95.0
34.0	93.2
33.0	91.4
32.0	89.6
31.0	87.8
30.0	86.0
29.0	84.2
28.0	82.4
27.0	80.6
26.0	78.8
25.0	77.0
24.0	75.2
23.0	73.4
22.0	71.6
21.0	69.8
20.0	68.0
19.0	66.2
18.0	64.4
17.0	62.6
16.0	60.8
15.0	59.0
14.0	57.2
13.0	55.4
12.0	53.6
11.0	51.8
10.0	50.0

## GLASGOW COMA SCALE

<u>Adult/Child</u>	<u>BEST</u>	<u>INFANT</u>
	<b>Eye Opening</b>	
Spontaneous	4	Spontaneous
To Voice	3	To speech
To Pain	2	To pain
None	1	No response
	<b>Verbal Response</b>	
Oriented	5	Coos, babbles
Confused	4	Irritable, cries
Inappropriate	3	Cries to pain
Incomprehensible	2	Moans, grunts
No response	1	No response
	<b>Motor Response</b>	
Obeys commands	6	Spontaneous
Localizes pain	5	Localizes pain
Withdraws	4	Withdraws
Flexion	3	Flexion
Extension	2	Extension
No response	1	No response
Total	3-15	Total

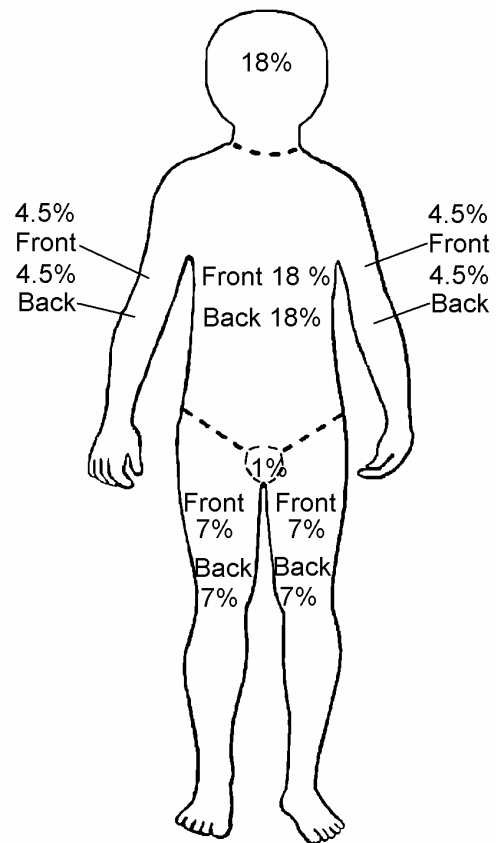
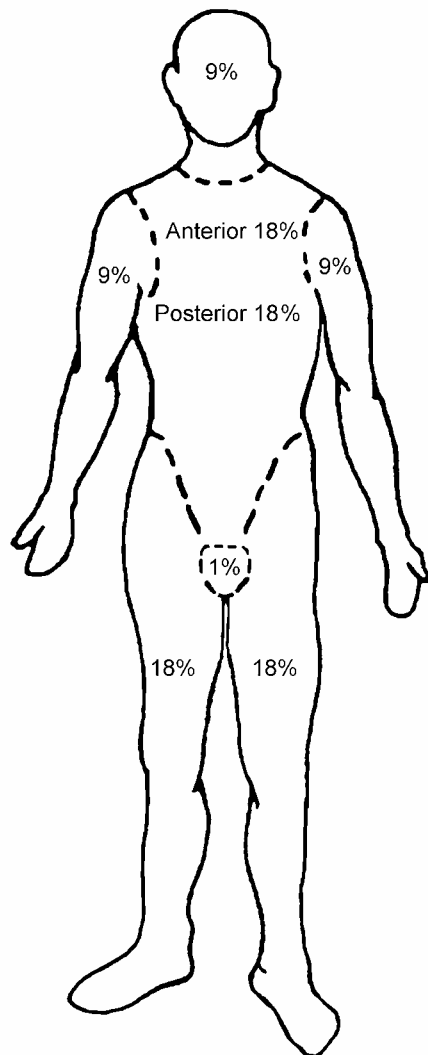
## PEDIATRIC VITAL SIGNS

Pediatric Vital Signs			
Age	Pulse	Resp	BP (systolic)
Birth	100-180	30-60	40-60
Neonate	100-160	30-60	60-90
Infant	100-140	30-60	80-100
Toddler	80-120	20-30	80-110
School Age	60-120	18-30	80-110
Adolescent	60-100	12-16	90-120

## TELEPHONE NUMBERS

<b>Local Dispatch</b>	
<b>Medical Control</b>	
<b>Local Medical Facility</b>	
<b>Receiving Hospital</b>	
<b>Local Medevac</b>	
<b>Police</b>	
<b>Family &amp; Youth Services</b>	1-800-478-4444
<b>Senior Services</b>	1-800-478-9996
<b>US Coast Guard</b>	1-800-478-5555
	225-5666 Juneau
	271-6700 Anchorage
<b>Poison Control</b>	1 800-222-1222
<b>Radio Frequencies</b>	
<b>SAR</b>	
<b>Dive Rescue</b>	
<b>Suicide Prevention</b>	1-800-SUICIDE

## RULE OF NINES





## ABBREVIATION LIST

ABC	airway, breathing, circulation	DT	delirium tremens
abd	abdominal	ECG	electrocardiogram
ABG	arterial blood gas	ED	emergency department
ACLS	Advanced Cardiac Life Support	eg	for example
AED	automated external defibrillation	EMS	emergency medical service
AHA	American Heart Association	EMT	emergency medical technician
AICD	automatic implantable cardioverter/ defibrillator	ET	endotracheal tube
AIDS	acquired immunodeficiency syndrome	ETA	estimated time of arrival
ALS	advanced life support	ETOH	ethyl alcohol
AMI	acute myocardial infarction	ETT	Emergency Trauma Technician
ASAP	as soon as possible	F	Fahrenheit
ASR	acute stress reaction	FiO2	fraction of inspired oxygen
AVPU	alert, voice, pain, unresponsive	Fr	french
BG	blood glucose	Fx	fracture
BLS	basic life support	GCS	Glasgow coma scale
BP	blood pressure	GI	gastrointestinal
BSA	body surface area	gm	gram
BSI	body substance isolation	gtts	guttae (drops)
C	centigrade	GU	genitourinary
c/o	complaint of	HAZMAT	hazardous materials
CDC	Centers for Disease Control	Hg	mercury
CHB	complete heart block	HR	heart rate
CHF	congestive heart failure	HTN	hypertension
CISD	critical incident stress debriefing	Hx	history
CISM	critical incident stress management	ICP	intracranial pressure
CME	continuing medical education	IM	intramuscular
CNS	central nervous system	IO	intraosseous
CO2	carbon dioxide	IV	intravenous
COPD	chronic obstructive pulmonary disease	IVP	IV push
CPR	cardio pulmonary resuscitation	J	joule
CSF	cerebral spinal fluid	Kg	kilogram
C-spine	cervical spine	LMA	laryngeal mask airway
CT	computerized tomography	LMP	last menstrual period
D50	dextrose 50%	LOC	loss of consciousness
D5W	dextrose 5% and water	LR	lactated ringers
		MCI	mass casualty incident
		MDI	metered dose inhaler
		mEq	milliequivalent
		mg,	milligram
		MI	myocardial infarction
		Min	minute
		MOI	mechanism of injury
		MVC	motor vehicle crash

NG	nasogastric	prn	pro re nata (as needed)
NPA	nasopharyngeal airway	psi	pounds per square inch
NPO	nil per os (nothing by mouth)	Pt	patient
NRB	non-rebreathing mask	PVC	premature ventricular contraction
NS	normal saline	RN	registered nurse
NTG	nitroglycerin	RSI	rapid sequence induction
O2	oxygen	SL	sublingual
OPA	oropharyngeal airway	SpO2	pulse oxygen saturation (pulse oximetry)
OPQRST	onset, provocation, quality, radiation, severity, time	SQ	subcutaneous
P	pulse	ST	sinus tachycardia
PASG	pneumatic anti-shock garment	SVT	supraventricular tachycardia
PE/Kg	Phenytoin Equivalent	TCP	transcutaneous pacer
PEA	pulseless electrical activity	VF	ventricular fibrillation
PFD	personal flotation device (life jacket)	VS	vital signs
PMH	past medical history	VT	ventricular tachycardia
PO	per os (by mouth)	WCT	wide complex tachycardia
PPE	personal protection equipment	wt	weight
PPV	Positive pressure ventilation	yo	year old